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EVOLUTION

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INVOLUTION.

A POPULAR EXPOSITION OF THE DOCTRINE OF TRUE EVOLUTION, A REFUTATION OF THE THEORIES OF HERBERT SPENCER, AND A VINDICATION OF THEISM.

By

ARZE Z. TRRED.

"* * * * * let no man out of a weak conceit of sobriety, or an ill-applied moderation, think or maintain that a man can search too far or be too well-studied in the book of God's word, or in the book of God's works, divinity, or philosophy; but rather let men endeavor an endless progress or proficience in both."—*Bacon's Advancement of Learning.*

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Agnosticism must be met on its own Ground, and defeated with its own Weapons.

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ERRATA.

Page 12, line 36, for *untramelled*, read *untrammelled*.
Page 15, line 15, for *Emanuel*, read *Immanuel*.
Pages 16, 252, 255, foot-notes, for *Meikle John*, read *Meiklejohn*.
Page 17, foot-note, line 2, for *convre*, read *couvre*.
Page 17, foot-note, line 7, for *ancune*, read *aucune*.
Page 17, foot-note, line 7, for *rê elle*, read *rêelle*.
Page 17, foot-note, line 10, for *l'antre*, read *l'autre*.
Page 33, line 25, for *render*, read *renders*.
Page 37, line 23, for *rythm*, read *rhythm*.
Page 60, line 11, for *rythmic*, read *rhythmic*.
Page 38, line 9, for *diagramatically*, read *diagrammatically*.
Page 108, line 36, for *the nature of which*, read *of the nature of which*.
Page 127, line 22, for *Diatomaciae*, read *Diatomaceae*.
Page 145, line 1, for *serve*, read *serves*.
Page 164, line 16, and table of civilization, for *Des Cartes*, read *Descartes*.
Page 165, line 31, for *succed*, read *succeed*.
Page 166, line 17, for *independence*, read *interdependence*.
Page 171, line 18, for *of Rome*, read *at Rome*.
Page 172, line 28, for *has*, read *have*.
Page 186, line 21, for *are*, read *is*.
Page 189, line 33, for *were*, read *where*.
Page 104, foot-note, for *Ninevah*, read *Nineveh*.
Page 198, line 27, for *Babalonian*, read *Babylonian*.
Page 236, line 4, for *becomes*, read *become*.
Page 257, line 12, for *form*, read *forms*.
Page 249, lines 10 and 14, for *Ahriman*, read *Ormuzd*, and for *Ormuzd*, read *Ahriman*.
Page 249, line 13, for *Ormuzd*, read *Ahriman*.

To

My Dearly Beloved Wife,

whose Sympathy and Encouragement

Enabled the Author to lay these

Pages before the Public.

PREFACE.

A popular exposition of the doctrine of Evolution from the stand-point of Theism has been a long-felt want. Scientifically considered, Evolution is no longer a mere hypothesis, but has assumed its place among the recognized truths which the intellect of man has wrung from the arcana of nature. The rounded outlines of the doctrine of Evolution rise up before us in all their fullness and beauty, challenging alike our admiration and veneration. It may be likened to a majestic temple, whose broad foundations are laid upon the everlasting rocks of truth, and whose mighty dome embraces the Universe. Through man's patient toil and industry, nature has yielded up the treasures with which this wondrously beautiful edifice has been erected. One by one the stones have been placed, until the swelling proportions of column and dome warn us that the hour of dedication is at hand. Let all who will enter in and worship. Generations have perished in the great undertaking since the corner-stone was laid, but the upward course of the structure has not been stayed, and the work of every generation has enabled its successor to build higher and truer. Many of those who have been the foremost builders in erecting this grand structure have failed to realize the significance of their own handiwork. "They builded better than they knew."

The chief object of the following pages is to do somewhat toward stemming the torrent of Sceptical or Agnostic belief which is sweeping away old land-marks and essaying to undermine the very foundations upon which religion and morality are based. Whilst the ultimate triumph of these principles can never be doubted, yet it becomes the duty of every one whose convictions are deep and earnest so to act as if these principles were in jeopardy, and to do all in his power to turn back the destroying tide.

By no feature is the nineteenth century more clearly marked off from all the centuries that have preceded than by the wide diffusion of knowledge among the masses; and this, which is true of European countries, is still more conspicuously the case with the

United States. Subjects which an hundred years ago were only handled in the lecture-room of science have now become public property, and are discussed by every age, sex, and condition. Books have been multiplied to an incredible extent, and rendered accessible to even the poorest among us. Public libraries are opened on every hand, and learning is scattered broadcast.

Fifty years ago the teachings of the great Frenchman, Lamarck, found but few hearers, but ignorant indeed must be the man at the present day who has not heard of the so-called Darwinian theory. The sum total of Darwinism in the minds of many who pass for men of more than average intelligence is that there is no God, and that we are descended from the monkey.

The violent opposition which the doctrine of Evolution has met with in the last two decades from the best and noblest minds of the day is the result of the *false* interpretations to which it has been subjected.

In the hands of its principal expounders, the doctrine has arrayed itself unblushingly against the highest and most sacred truths known to man; thus was inaugurated that conflict between religion and science, so-called, which still rages. The so-called Evolutionists, putting their own interpretations upon the truths of nature, affirmed that there was no alternative: that religious teachers must either give up their Religion or reject the positive revelations of Science. Called upon to *weigh the Higher by the Lower*, could there be a doubt as to the decision of a truly high-souled man well grounded in the teachings of religion and the axioms of morality? Evolution was unhesitatingly branded as false; they preferred the light of the noon-day sun to the flickering of a taper! So long as the doctrine of Evolution received the one-sided interpretation placed upon it by the antagonists of revealed religion, so long did religious teachers preach a crusade against that which threatened the best interests of Humanity. But these false interpreters of scientific truth are rapidly giving place to a set of men who, equally armed with the weapons of science, see in the theory of Evolution nothing which is in conflict with the truths of revealed religion.

The writer of this work, in the course of his studies, became more and more convinced that the conclusions arrived at by Mr. Spencer and others were essentially false—that their system, in a word, was not one of Evolution at all, but a theory of Involution.

On reading Mr. Spencer's "First Principles," I learned that he himself recognized this, and acknowledged it in so many words. (See First Principles, 2d edition, p. 286.)

This is not the place to enter upon a criticism of the obvious inconsistency of calling that a process of Evolution which leads to Involution. I at once discovered that Mr. Spencer had *inverted* the telescope and was viewing the Universe through the *large end.* I found out later that I was not alone in my understanding of Mr. Spencer's system, and that others had arrived at the same conclusions. Thus, Mr. Martineau, in his criticism, showed the unfitness of the word Evolution to express Mr. Spencer's theories, and gave its true meaning in these words: "It means to unfold from within; and it is taken from the history of the seed or embryo of living natures. And what is the seed but a casket of prearranged futurities, with its whole contents prospective, settled to be what they are by reference to ends still in the distance?"

Mr. Spencer replied to this criticism as follows:

"Now, this criticism would have been very much to the point did the word Evolution truly express the process it names. If this process, as scientifically defined, really involved that conception which the word Evolution was *originally* designed to convey, the implications would be those Mr. Martineau alleges. But, unfortunately for him, the word, having been in possession of the field before the process was understood, has been adopted merely because displacing it by another word seemed impracticable. And this adoption of it has been joined with a caution against misunderstandings arising from its *unfitness.* Here is a part of the caution: 'Evolution has other meanings, some of which are incongruous with, and some even directly opposed to, the meaning here given it. * * * The antithetical word Involution would much more truly express the nature of the process, and would, indeed, describe better the secondary characters of the process which we shall have to deal with presently.' So that the meanings which the word involves, and which Mr. Martineau regards as fatal to the hypothesis, are already repudiated as not belonging to the hypothesis."

In this confession, Mr. Spencer sounded the death-knell of his own system. Whilst I could not accept the "Evolution" of Mr. Spencer, I could readily accept the Evolution which, in *ultimate*

definition, means a progressive *unfolding* of a Supreme Divine Will. I soon became satisfied that the doctrine of True Evolution, instead of being antagonistic to the existence of a Being distinct from the Universe, carried with it demonstrative proof of His existence—that it furnished one of the strongest weapons wherewith to combat and overthrow the false teaching which had *usurped* the name of Evolution. This point reached, I argued that, independent of the scientific evidence in its favor, it became my *bounden duty* to accept that which would place Theism on such an impregnable basis.

The ancient stronghold of the vulgar Atheist was based on the ground that "the world has always been essentially as it is now." This bare assertion could not be scientifically refuted until the truths of Geology and Paleontology demonstrated that this view of things was false—that there was a time when no life existed on the globe, and that there has been a gradual development of animal and vegetable life from the beginning. The theory of Evolution expounded in the following pages, which we may designate by the title True Evolution to distinguish it from the False Evolution or Involution of Spencer, teaches that the Universe is the expression of the Supreme Will, which has been unfolded by a continuous and gradual process. In other words, it teaches that the Universe has been created through the agency of secondary laws.

I need hardly say that the significance of the scientific evidence for Evolution has been augmented an hundredfold since it confirms the promptings of the moral sense, and places the eternal truth of Theism upon such unassailable ground. No true Theist should cast from him this only weapon which physical science can furnish to overthrow the errors of Atheism, whether it calls itself Pantheism, Agnosticism, or Monisticism.

Let religious teachers see to it that they do not treat with contempt the writing inscribed on the rocks by the hand of Omnipotence, for it is a revelation as certainly as those Ten Commandments which constitute the Mosaic Law.

In attempting to treat within so small a compass this vast subject, I have aimed only to bring forward the salient truths upon which the doctrine rests, and have endeavored to eliminate everything which did not contribute conspicuously to that end. As the book is intended for that portion of the reading public whose sci-

entific attainments are very general, I considered that it was more important to keep before the mind the great issues rather than to perplex it by diffuseness of detail.

In the arrangement of the work, I have been guided solely by the desire to present the facts in their appropriate relations, thus bringing before the mind a rounded outline of the whole. The first chapter is devoted to a brief historical sketch, in which the reader will see that the history of the doctrine is an illustration of the doctrine itself. The second chapter defines what we are to understand by Evolution, and enters upon the criticism of Mr. Spencer's System. The fallacies of Agnosticism are touched upon, and the chapter concludes with a parallel drawn between the theory of Special Creation and Creation by Evolution, showing the vast superiority of the latter in fulfilling our religious and moral needs.

In the next seven chapters, the subject of COSMOGENESIS, or Evolution of the Universe, is discussed under the following headings:

Astrogenesis, or the Evolution of Worlds.
Biogenesis, or the Evolution of Life.
Phylogenesis, or the Evolution of the various Species, Genera, &c., both animal and vegetable.
Ontogenesis, or the Evolution of Individual Forms, as the chicken from the egg, the plant from the seed, &c.
Psychogenesis, or the Evolution of the Soul.
Sociogenesis, or the Evolution of Society.

This order has not been followed throughout, as it was deemed expedient to marshal the evidence upon which organic Evolution is based before entering upon the discussion of the origin of Life on the Globe, and the possible lines of development which it pursued in its upward growth. The subject of Ontogenesis is therefore treated next after Astrogenesis, and all the chief arguments for organic evolution are embraced in the same and succeeding chapter.

Criticisms upon Mr. Spencer's theories are scattered through the work, but are chiefly centered in the second, tenth, and eleventh chapters, and their total inadequacy to fulfill the higher needs of man is, I hope, clearly demonstrated.

The Author disclaims all intent to reflect upon Mr. Spencer personally; his system is alone in question. If, therefore, in the warmth of conviction, emphasis is placed upon his errors, it is not

to be looked upon as directed against the man, but against the teachings which he has laid before the world.

In my desire to insure a clear understanding of the subject, I have, on important points, rather courted repetition than avoided it.

The introduction of a number of new terms will, I hope, contribute to a better understanding of the subject.

The Author is deeply conscious of the many shortcomings of the work, but if its perusal will set at rest conflicting doubts as to the existence of a Supreme Beneficent Creator, the object for which it was written will have been fulfilled.

June 19th, 1884.

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CHAPTER I.

HISTORICAL SKETCH.

"History repeats itself."

The ideas underlying the theory of evolution are older than the mythology of the ancient Greeks. The human mind, even at that early period, groping in the darkness after the mystery of existence, embodied in the fable of the *Elder Cupid* the genesis of the Universe. He was the oldest of all the gods, and without a progenitor, except only that he came from the Egg of *Nox*, (night,) and from him all things sprang. I need hardly say that this Cupid is not to be confounded with that *Younger Cupid*, the mischievous son of Venus, and youngest of all the gods of Olympus. No doubt the former suggested the latter, and the attributes of both were the same, viz: *Love*, *Archery*, *Nudity*, *Blindness*, and *Perpetual Youth.*

In the personality of the Elder Cupid, the ancients symbolized the ultimate ATOM of matter. His birth from the Egg of NIGHT finely expresses the origin of the atoms on the bosom of the dark primeval void. The attribute of Love shadows forth the *law* of the attraction of *Gravitation*, for the bond which draws atom to atom may be likened to the sentiment of Love; he was gifted with Archery, for the attraction of gravity may be said to radiate from the atoms themselves—shot forth as it were—and works through great distances as well as small; he was represented Nude, for the atom is the ultimate form of matter, without parts, and may therefore be said to be without dress or covering;* he was blind,

* The *atom, considered simply as matter*, is destitute of parts, but considered as the *agent*, by means of which the material universe has been brought into existence, it becomes the most *complex* of all created things, for it carries with it the innumerable *laws* which the Creator impressed upon it in the beginning. The unfolding of these laws, as we shall see in the next chapter, constitutes *true* evolution. The sixty-seven elements known to the chemist are the various combinations which the atoms assume.

for the atoms attract one another without discrimination ; * he was gifted with perpetual youth, for the atom knows no change, † but is the same now as it was in the beginning of things.‡ In this old fable, whose origin is traced into the dim obscurity of a mythological age, we see epitomized the modern theory of evolution. After a long sleep of centuries, buried beneath the dust and ashes of system on system of philosophy, it again emerges to the light of day. The atomic doctrine is first spoken of in connection with the name of Leucippus. This philosopher belonged to the Eleatic § school, which was established by Xenophanes about 500 B. C. Leucippus was a pupil of Zeno of Elea, who was a disciple of Parmenides, who, in his turn, was a disciple of Xenophanes. This school was distinguished for its cultivation of the physical sciences. Leucippus surpassed all his predecessors, and first promulgated the atomic theory of the Universe advocated later on by Epicurus and Lucretius, and revived in modern times by Bruno, Kant, and Laplace. Democritus followed in the footsteps of his master, Leucippus, and taught that the whole Universe consists of atoms, which once existed equally diffused throughout space. These atoms were in perpetual motion and gradually coalesced into masses through the influence of attractive energy, and in course of time the whole Universe was evolved. But, whilst history points to Leucippus and his disciple, Democritus, as the founders of the atomic doctrine, there is every reason to believe that the theory had been promulgated long prior to their time, and the existence of the fable referred to in the beginning of this chapter seems to strengthen this conjecture. It is highly probable that the idea of atoms originated in the East, that great store-house of ancient learning. It was a universal custom among the early Greek philosophers, with those,

* The law of universal attraction, discovered by Newton, or rather formulated by him, postulates that every atom in the universe attracts every other atom.

† The great diversity of form which matter has assumed can only be explained by the workings of the laws with which it has been united. The PHASE or form which matter takes thus becomes the *material* manifestation of pre-existing ideas.

‡ See Bacon's interpretation of this fable in his "Wisdom of the Ancients."

§ Xenophanes, the founder of the Eleatic school, was a disciple of Pythagoras, who established a school at Crotona, in Italy.

at least, with whom we are acquainted, to spend some years of study and travel, and they often penetrated as far as India in quest of knowledge. It was thence that Pythagoras derived his doctrine of metempsychosis, or transmigration of souls, and it is possible that he obtained his knowledge of the true nature of the solar system from the same source, either directly or indirectly.* In the early civilizations, fable or allegory was the dress in which the doctrines of the wise were concealed from the common herd of mortals. The masses of the people were never initiated into the deep mysteries of nature, hidden under these allegories. Nor would it have been wise to have attempted such instruction, for the general intelligence was too low to receive such high truths, and their promulgation could have resulted only in mystification to the pupil and ruin to the teacher.

Thus, while the people at large were steeped in ignorance and practiced superstitious observances to more than a hundred gods, the philosophic minds of the favored few arose to heights of refined abstraction, which the human intellect has never since surpassed. Prior to the time of Leucippus, nearly all the old Greek philosophers recognized the existence of a supreme spiritual essence, (knowledge of which they had derived from the East,) which pervaded all things and to which all things were due. With many of them this idea was refined into a pure monotheism, or belief in a supreme intellectual personality, the Creator of all things.

The advent of Leucippus marked an era in philosophy, for he seemed to find in the ultimate atoms of matter, and the forces *inherent* in them, an all-sufficing cause of the origin of things, and he seems to have entirely ignored the existence of a spiritual element in the Universe. This philosophy has been revived from time to time since his day, and in the modern monistic philosophy we find exactly the same ideas of the ultimate nature of things embodied.

The atheistical doctrines of Leucippus and Democritus found able antagonists in the three greatest of all the Greeks, Socrates,

* Pythagoras, the most illustrious physician and philosopher of his day, taught that the sun was in the center of the solar system and that the planets revolved around it. His master, Thales, was also acquainted with the true nature of the solar system. It is, therefore, likely that he obtained his knowledge from Thales, who possibly derived his from the East, for he was a great traveler.

Plato, and Aristotle. In the refined idealistic minds of Socrates and Plato, the spiritual reigned as the great tangible reality upon which all things rested for support; with them matter was of secondary importance, and bears the same relation to spirit that the shadow does to real substance. Aristotle, like his great preceptor, Plato, was thoroughly imbued with the spiritual reality underlying all things, but he also recognized the importance of studying the baser substance, and so successful was he in his physical inquiries that he not only surpassed all his predecessors, but the limits which he marked are still, in many directions, the bounding lines of our knowledge. His acquaintance with biology was so extensive and minute that it enabled him to rise to some of the grandest generalizations of comparative anatomy, and to make discoveries which have only been *re-discovered* in comparatively recent times.

It is almost certain that he thoroughly understood the circulation of the blood, afterwards re-discovered by Servetus and Harvey. He knew that the young of certain species of shark are partially developed in the mother's body by a kind of placental attachment. This fact was only re-discovered as late as 1839, by Johannes Muller, of Berlin. He was acquainted with the method of development of the cuttle-fish, and the peculiar manner of propagation among bees. The absurdities and inconsistencies which are found in his writings must be attributed to corruptions.

Aristotle's advantages for the study of biology were peculiarly great, for he was the preceptor of Alexander, and the Conqueror of the East spared no pains to supply his teacher with the rarest specimens of animal and vegetable life. A corps of collectors always accompanied him, and the specimens were finally handed over to Aristotle for his examination. Whilst Alexander did all in his power to assist his master by furnishing him the means of making his discoveries, he was also anxious to monopolize the discoveries that his master made, and did all he could to discourage and prevent their publication. This ambitious king wished to be without a rival in learning as well as in war.*

* "Very few of the writings of Aristotle were published during his lifetime. Among these few were probably his Poetics and his Art of Rhetoric. The rest of his works he bequeathed to Theophrastus, who left them to Neleus. Scepsius; the latter sold a part of them to Ptolemy Philadelphos, and these perished in the burning of the Alexandrian library. The rest were buried,

After the subjugation of the Persian Empire, Alexander wrote to Aristotle as follows: "Alexander wishing prosperity to Aristotle. You have not done right in publishing your acroamatic works; for in what shall we surpass others, if the doctrines in which we were instructed become common to all men? I, indeed, would rather excel others in the knowledge of the most excellent things than in power." To this Aristotle returned the following answer: "Aristotle to King Alexander, wishing prosperity. You wrote to me concerning my acroamatic works,* thinking that they ought not to have been divulged. Know, therefore, that they are published, and *not* published, for they can be understood by my auditors alone. Farewell."† From this it is apparent that much of the obscurity in the writings of Aristotle was studied by him.

Aristotle's great genius and knowledge led him to speculate upon the relations which the phenomena of nature bear to one another, and taught him to recognize the power of nature in modifying the animal frame, thus enabling him to anticipate the modern theories of development. After discussing the whys and wherefores of certain natural phenomena, he makes the same inquiry with regard to animals. "What prevents that the parts in nature (of an animal) may thus subsist? For example, that the teeth should originate from necessity, those in front sharp, and fitted for dividing, but the grinders broad and adapted for crushing the food. It may be argued that they were not made for this purpose, but that it so chanced; and similarly with other parts of the body, which apparently exist for some definite purpose. Where, therefore, all things occurred as if they were intended for some special end,

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as is said, for the sake of preservation, in some subterraneous vault, where they lay forgotten for one hundred and thirty years, and at their recovery were found in a very defective state from decay. In that state they fell into the hands of Apellicon of Teos, who supplied the deficiencies from his own invention. They came, finally, into the possession of Tyrannion, the grammarian, who used the same freedom to a greater degree. Hence we must make much allowance for the imperfection, obscurity, and, perhaps, contradiction, which may be found in the writings of Aristotle as they now appear."—*Tytler's Universal History.*

* The "Physics" and "Metaphysics" are here referred to.

† Quoted by Taylor.

these were preserved, being properly constituted by an internal tendency ; but things that were not thus constituted were lost, and are still lost."*

Aristotle here recognizes the mutability of animal forms, through the agency of an internal tendency and the elective power of nature confirming and assisting this tendency. A little further on he ably combats the *chance* philosophy of Leucippus and Democritus, by showing that *Design* is as clearly exhibited by nature in her workings as it is in man's. And he bases his argument on unassailable ground by pointing out that if Democritus considers man's mind as a part of nature, (which he must necessarily do, for he postulates that the atoms produced all things,) it is obvious that, to be consistent, he must ascribe Design to nature as much in one form as in another, and that, consequently, if he attributes Design to *man's works*, he must also allow it to the rest of nature. He says: "There is, therefore, an existence for some special end in things which are produced by nature. Again, in things where there is a definite end to be attained, the cause of these things is originated *for the sake* of this end. Accordingly, therefore, as it is brought about, so is it *intended* by nature to be brought about; and according to the natural tendency of anything so will it be produced, *unless there is some impediment.*† Now, that which is produced is produced for some special end, and, hence, it was intended by nature to be produced for the sake of this end. For example, if a house ranked among the things which are naturally produced, it would be built by nature in the same way as it is now by art. Also, if things which are now produced by nature only were also produced by art, they would be produced in a similar manner, and according to a natural tendency. The one, therefore, would exist for the sake of the other (the natural tendency would exist for the object to be attained); and, indeed, art partly imitates natural processes in perfecting the things which nature is incapable of bringing to perfection. If, therefore, artificial things are produced for the sake of something, it is evident that this is

* Physical Auscultations, Book II, chapter viii.

† Here is a recognition of the power of *External* nature to influence *Internal* nature, (*i. e.*, the inherent tendency of the individual,) and to elect those variations which are most suitable for the individual to adapt itself to surrounding conditions.

also the case with things which nature has produced. * *
* * * * * * * * *

Hence, if the swallow forms her nest, and the spider her web, for a special object, and if plants bring forth leaves for the sake of the fruit, and the roots tend downward, and not upward, for the sake of nourishment, it is evident that a cause of this kind (*i. e.*, a cause of special Design) belongs to those things which are produced by nature."*

None of the writings of Democritus, nor of his master, Leucippus, have descended to our own times, but we learn through Aristotle and other ancient writers, that their philosophy was essentially as follows: They asserted that, in the beginning of things, the Universe consisted of an infinite number of self-existent atoms in a perpetual state of motion. These atoms were not only infinite in number, but they were also of innumerable shapes.† They reasoned that, if the atoms were all exactly alike in figure, the resulting combinations would also be similar, hence there could be no variety in the forms of matter. They could, therefore, only reconcile their theory to the existing order of things by giving the atoms different shapes, and assigning a different order and position to each in forming the various combinations which make up the Universe. Figure, Order, and Position of the atoms formed the tripod upon which they rested their theory of the Universe. As they recognized no intelligent power independent of and superior to matter, they were compelled to ascribe the order and position in which the atoms fell to the attraction which atoms of the same shape had for one another. This innate tendency on the part of the atoms to attract those of like shape was materially assisted by the *chance* combinations which would result from the atoms moving among one another throughout an infinite time. To this fortuitous coming together, and the mutual attraction of similars, they ascribe the origin of all things. Aristotle combats this theory, that the atoms are the first cause of things, by proving that the atoms cannot be infinite in number, for if they were, universal space would be so filled with them that all motion would be impossible, and the *whole*

* Physical Auscultations, Book II, chapt. viii.

† Modern scientists hold that all the atoms are exactly alike, and attribute the various forms which matter assumes to a difference of combination.

Universe would be a Solid Mass. The mere fact that the atoms can move among one another is demonstrative proof that *all space cannot be filled*, hence, the number of the atoms *cannot be Infinite.*

This being proved, he further shows that the *perpetual duration* of motion, which Democritus postulates, can have no existence, for such a motion presupposes an Infinite power. But how can an *Infinite Power exist in*, or be exerted by, a Finite Magnitude? (*i. e.*, a finite number of atoms.)

Having thus destroyed the airy fabric of Democritus, he proceeds to show that there is an Original Motive force outside of matter, and that the First Mover has no Corporeal existence (is spiritual in its nature); that it is Immovable, (knows no change,) and Indivisible; in other words, that it is an Intelligent will-power which holds matter in subjection, and can impress upon it, if it so will, an infinite motion both in duration and extent. In the closing chapter of the "Physics," he completes his great argument against the Materialism of Democritus, thus:

"Hence, that motion only is perpetual which is produced by the Immovable, for, always existing the same, it will always bear the same relation to that which is moved. These things being determined, it is evident that it is impossible for that which First Moves and is Immovable to have any Magnitude (material existence); for, if it had, it must of necessity be either Finite or Infinite. Now, it has already been demonstrated that it is impossible that there could be an Infinite Magnitude, and it has just been proved that infinite motion could not be produced by a finite magnitude; but as the *first* mover does produce a motion perpetual in duration and infinite in extent, hence, it is evident that *It* (the first mover) is *Indivisible, without parts*, and has no Magnitude (no material existence.")

Aristotle thus defeats Democritus with his own weapons, and demonstrates the absurdity of his doctrine; and proves that all things are suspended from an Infinite Intelligence, and in this he agrees with Plato, who, in his Timaeus, discovers the Supreme Intelligence, the Creator of the Universe.

Epicurus, (B. C. 342–270,) the founder of the celebrated sect of that name, in his physical philosophy followed to a great extent in the footsteps of Democritus. An elaborate exposition of his views, which correspond essentially with those of Democritus, has

come down to us in the writings of Lucretius, who lived during the first century B. C. Lucretius embodied his philosophy in a poem entitled "*De Natura Rerum.*" He discusses at great length the ultimate nature of things, and demonstrates that there *must* be ultimate particles of matter which are *absolutely solid*, *unchangeable*, and *indestructible.* He shows that all space cannot be completely filled with these atoms, otherwise all motion would be impossible. He ascribes the various forms which matter assumes to the various combinations, and shows that there must be a multitude of different figures in these atoms, else their combinations would all be similar in character. He recognizes no intelligent power outside of matter, and asserts that the atoms are self-existent, and have been moving through space from all eternity, and that they have fallen into their present combinations by *chance.* He regards the mind as a subtle kind of matter, (composed of atoms of a special size and figure,) which undergoes dissolution with the body and returns to its original atomic state. The personality of the individual is, therefore, annihilated at death, and for Lucretius there is no immortality.*

"Hence, death is nought, and justly claims our scorn,
Since with the body thus the soul decays.
And as we now, through long anterior time,
Look back indifferent on the PUNIC hosts
That threatened ROME, when, with the din of war,
All shook tremendous heaven's high cope beneath,
And doubtful hung the scale which power should rule
Earth, main, and mortals, with unrivaled sway;
So, when we cease, and soul and body once
Meet their joint doom whose union formed our lives,
No ill shall then molest us—nought alarm
Our scattered senses, and dissevered frame,
Though earth with main, or main commix with skies.
E'en could the soul, the spirit, still survive
The wreck corporeal, and perception boast,
To us what boots it, who exist alone
The joint result of soul and body mixt?

* The Monistic philosophers of to-day, among whom we may mention Hæckle, Spencer, Huxley, and Tyndall, hold essentially these same views They recognize no spiritual element in the mind, but regard intelligence as a result of *atomic action*, pure and simple. Hence, with them, there is no immortality.

> To us what boots it, should some future time
> Collect our atoms, the dismantled frame
> Restore entire, and e'en with life relume,
> When once the memory of ourselves is fled?" *

Thus the poet sums up his non-belief in a future state, and tells us that death is the goal of existence. The materialistic doctrines of Lucretius, like those of his predecessor, Democritus, find a full and sufficient refutation in the sublime arguments of Aristotle.

Having shown that the doctrine of evolution is hoary-headed with age, and that its origin may be traced to a high antiquity, we will spend no more time in following its course and progress among the ancients, but descend to more modern times.

The philosophy, literature, and art, for which Greece was so highly distinguished among the nations of antiquity, rapidly diminished under the preponderating power of Rome. The policy of that state was one of conquest, and the great aim of all her rulers was to establish her military supremacy and to extend the limits of her empire. The road to preferment and distinction lay through the exercise of those faculties which we possess in common with the brutes, and rapine and bloodshed furnished the only channels in which men could excel their fellows with the hope of reward. Rome was a military power in the most comprehensive sense of the word, and, when not engaged in subduing intestine troubles or repelling foreign invaders, she was occupied in extending the sway of her arms and enlarging the boundaries of her dominions. This warlike spirit, which she inherited, in common with all nations, from savage beginnings, had never been mitigated by the softening and exalting influence of intellectual pursuits. Literature, science, and art, she had none primarily, and what she did ultimately possess was the offspring of her contact with the higher civilization of Greece. But in a nation where the highest distinctions and rewards are reserved for achievements in war, a high degree of civilization is not to be looked for. In the savage state, war is the common occupation of men, and just in proportion as civilization advances does the warlike spirit disappear, and men of intellect, in cultivating the arts of peace, seek to distinguish themselves in a more rational way than by murdering their fellowmen. Hence it is that, in the most civilized nations of the nine-

* Lucretius. Translated by Good.

teenth century, the military profession is held in such disesteem that few, if any, men of eminent intellectual merit are found identified with it.* And this is even the case among the monarchies of Europe, where the traditions of a barbarous age are still in the ascendant, and where the power of the sovereign largely depends upon a huge standing army for its support. But in the United States, where civilization has attained its highest development,† where individual merit receives its highest reward—not the reward which the breath of kings and princes can confer, but the distinction which the approbation of an enlightened people can give—the military establishment is reduced to nominally nothing, and the occupation of the soldier, in times of peace, is regarded with indifference and contempt. Grecian learning found but little encouragement in warlike Rome, and the great thinkers she produced are few and far between. The uninterrupted wars, both at home and abroad, and the slight esteem in which learning was held, were not favorable to intellectual pursuits. Later on the inroads of the northern barbarians, and the subsequent fall of the Roman power, almost annihilated taste for letters. What is known as the dark ages now began to settle like a funeral pall over the world, and for a period of nearly a thousand years violence and anarchy reigned supreme and all learning was confined to the priesthood. In the seclusion of their cells, the monks busied themselves in transcribing the writings of the ancients, and it is to their industry that we are indebted for what remains to us of Greek and Latin literature. The middle age may be regarded as the period during which the seeds of Grecian and Roman civilization, scattered broadcast by the storms of war among the barbarous nations of the north, were germinating; slowly but surely the tender plant reared its head, and, as it grew, enriched the soil around it, which, reacting, caused that rapid growth which soon enabled it to defy the warring of

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*This fact has been pointed out at some length by Buckle in his history of civilization.

†That nation must be regarded as the most highly civilized in which knowledge is most widely diffused among the masses of the people. No one who knows anything of the condition of the masses in Europe will deny that the United States enjoys the distinction of being the most enlightened nation on the earth. Free institutions depend upon the capabilities of a nation for self-government, and such capabilities pre-suppose a high degree of enlightenment.

adverse elements. The invention of printing, that great engine of enlightenment, gave an impulse to civilization the importance of which cannot be exaggerated. It arose upon the horizon of the dark ages the harbinger of a brighter era, and the clouds of ignorance and superstition fled before it like the mists of the morning at the appearance of the effulgent god of day. The diffusion of knowledge, and the general intellectual elevation thereby induced, is a surer test for the degree of civilization which a nation has attained than any other; and this general diffusion of knowledge is the grand distinguishing feature of the civilization of modern times as compared with that of the past. It is not that we have attained to higher *individual* elevation, for the past history of the world furnishes innumerable examples of individual genius which later ages cannot parallel; but the high mountain-peak is bathed in light whilst the valley below is buried in shadow, and the light which it reflects may be as a beacon to a far distant traveler, while the wayfarer at its base may be groping helplessly along in the darkness.

The sacred fire of genius in its lofty soarings catches the first rays of truth, and transmits the light it receives to far distant ages for the guidance of future nations, whilst the age which gave it birth may be so steeped in ignorance and superstition as to be unable to avail itself of the light in its midst.

Thus, a nation may possess a science, a literature, and an art enriched by the highest gifts of genius, but if that science and that literature are confined to a favored few, whilst the people at large wallow in ignorance, that nation cannot be said to have attained a high degree of civilization.

The rapid growth of all branches of knowledge which followed the invention of printing is demonstrative proof that the more widely knowledge is diffused the greater will its progress be, for a greater number of individuals will be engaged in its advancement. The first step made in our modern civilization was the revival of the learning of the ancients. Their works, which monkish industry had preserved from utter destruction, were rapidly reproduced, and there soon arose a class of thinkers who, untrammelled by the narrowing influences of Romish superstition, repromulgated to the world those great truths which ancient genius had discovered.

Few, indeed, are the great lights which illumine the dark period prior to the invention of printing; and the names of Albertus Magnus and Roger Bacon stand out like brilliant beacons in a black tempestuous night.* In 1473, about thirty-three years after the discovery of printing by Guttenberg, was born the celebrated physician, astronomer, and mathematician, Nicolas Copernicus. He either revived or rediscovered the Pythagorean theory of the solar system, with which his name is now identified. Copernicus died a short time after the promulgation of his great doctrine. Had he lived, he would, in all probability, have suffered the persecution which subsequently compelled Galileo to recant his belief in the same theory. The sixteenth and seventeenth centuries are particularly rich in great names, and the sciences made rapid progress.

The Italian, Giordano Bruno, was among the first to revive the atomic theory of the universe, for which he suffered death at the stake in 1600. He was followed by Gassendi, who, about the year 1647, published a work on the life and writings of Epicurus. About the same period, Descartes† gave his theory of "Vortices" to the world. These three names are to be regarded as the modern precursors of Kant and Laplace, and the first to repromulgate the theory of Evolution as applied to the inorganic Universe.

Medicine, the mother of the sciences, which, during the preceding period of the Middle Ages had been almost entirely confined to the priesthood, now became a favorite study with every mind

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*Albertus Magnus, a Dominican monk, who became Vicar General of his order, and Bishop of Ratisbon.

He was distinguished for his skill in medicine; and his general learning was so great that he was accredited with having dealings with the devil. B. in Suabia, 1205; d. 1282.

Roger Bacon, an English Franciscan monk, who received his education at the University of Oxford. He was a skillful physician, and wrote extensively on medical subjects. He is the reputed inventor of the air-pump, diving-bell, camera obscura, gunpowder, and the telescope, which Galileo afterwards reinvented. B. 1214; d. 1292.

†This celebrated man, in his moral doctrine, took the ground that there must be a Supreme Divine Intelligence, otherwise the mind could not conceive of such a being.

"J'ai tiré la preuve de l'existence de Dieu de l'idée que je trouve en moi d'un être souverainment parfait."

which sought an intimate acquaintance with nature; and the sciences of anatomy and physiology, which had made little or no progress since the days of Galen, now made wonderful strides.*

To these early students of anatomy, we owe our first knowledge of the development of the human body from its embryonic, or germ, state. The importance of such a knowledge for the further progress of the doctrine of Evolution will be appreciated later.

The most distinguished of these early students of Embryology were Fabricius ab Aquapendenti and Spigelius, professors at the University of Padua, whose works were published at the beginning of the seventeenth century. They were followed by Marcello Malpighi, of Bologna, and Harvey and Needham, in England.

A theory of Evolution now sprang up which became known as the theory of "*Encasement*," or "Preformation." According to this theory, all the parts of the perfectly-developed organism existed, preformed in the Egg, but extremely minute, and these parts were simply enlarged by growth during the progress of Gestation. This theory of "preformation" or "encasement" was probably suggested by the Homœomerian† doctrine of Anaxagoras, who flourished in the fifth century before Christ.‡ From Lucretius we learn that he believed "that bones are produced from *little bones*, that flesh is from small *particles of flesh*, and that blood is formed from many particles of blood meeting together. The discovery of the Sperm Cell of the male by Leeuwenhoek, in 1690, caused a division of the Preformationists into two parties; the one holding that the parts preëxisted in the male, whilst the other maintained the old theory, that they existed in the female, and the male element simply gave an impetus to their development.

* The only progress which medicine made during the Middle Ages was accomplished by the Arabians, and some of their writers became celebrated all over Europe. An anecdote, which will illustrate the esteem in which the writings of the Arabians were held at this period, is related of Louis XI, of France. Wishing to borrow the works of the celebrated Arabian physician, Rhasis, from the faculty of Medicine at Paris, he was compelled to deposit a large quantity of valuable plate, and to procure a nobleman to join with him in a deed, by which he bound himself to return it, under a considerable forfeiture.

† Homoios, like; and Meros, part.

‡ Anaxagoras, one of the most distinguished physicians and philosophers of antiquity. (500—428 B. C.)

The celebrated Leibnitz (b. 1646 ; d. 1716) advocated this latter theory. He was among the first to formulate the law of the *Continuous Gradation* of Created Beings. The theory of Encasement was advocated by the great physiologist Haller,* and received apparent support from the investigations of the Swiss naturalist, Charles Bonnet, who, about the year 1745, discovered the so-called virginal generation (Parthenogenesis) of plant lice.†

In the year 1759, the labors of Caspar Frederick Wolff‡ completely overturned the theory of Preformation, and he conclusively demonstrated the truth of his new doctrine of Epigenesis,§ or the gradual formation of *new* parts during the progress of development. With this discovery, the modern doctrine of Evolution, in so far as it relates to the development of organic life, properly begins. He proved that the parts of the perfect animal did not preëxist as *minute* organs, but that they were newly formed during the development of the Embryo. Embryology made but little progress until the celebrated von Baer took up the clew furnished by Wolff, and his exhaustive study of the development of the animal body from the Egg placed the science upon its present firm footing. He showed that the first step in the development of the Egg consists in the breaking up of the yelk into cells, and the subsequent production of germ layers from these cells.

The atomic hypothesis, for the revival of which Bruno suffered, received a new impetus at the hands of Emanuel Kant, (1724–1804,) Sir W. Herschel, (1738–1822,) and the great French mathematician Laplace, (1749–1827,) with which names, especially the latter, the "Nebular Hypothesis" has become identified.

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* The distinguished physician and poet, Albrecht von Haller, (1708–1777,) professor at the University of Gottingen, and known as the "Father of Phisiology." He formulated his belief in the phrase "*Nulla Est Epigenesis.*"

† Bonnet isolated a female plant louse from contact with the male, and in a month's time she gave birth to ninety-five female young. They multiplied in the same virgin manner. This was considered demonstrative of the truth of "Preformation."

‡ Wolff was born at Berlin 1733. He took his degree of Doctor in Medicine at the University of Halle, and subsequently accepted an invitation from the Empress Catharine, of Russia, to reside at St. Petersburg, where he died in 1794.

§ Harvey really preceded him in the enunciation of this doctrine, but Wolff elaborated it.

Kant was probably the most profound thinker of the last century, and the range of his knowledge was enormous.

The doctrine of Evolution, which he advocated in the development of worlds from a nebulous mass, he also extended to the world of life, but he held that the first germ of life on the globe was a direct act of creative power. Whilst he recognized the doctrine of Evolution, both in the animate and inanimate world, his great mind prevented him from falling into the Slough of Materialism which has been the fate of so many before and since his time. His studies into nature's hidden secrets only served to heighten his conception of the ideal world, and of that Intelligent Power to whom all things are due. He was willing to allow that man's body might have been developed from a lower order of creation, but he never lost sight of the great truth, that the real man is a Spiritual Substance, which, in its nature, has no affinity to the clay in which it lies entombed. He does not seem to have accepted the theory of Evolution until quite late in life, and in his "Critique of Pure Reason" he thus criticises the theories of Leibnitz:

"The so-called law discovered by Leibnitz, and supported with remarkable ability by Bonnet * * the law of the *continuous gradation* of created beings, which is nothing more than an inference from the principles of affinity; for observation and study of the order of nature could never present it to the mind as an objective truth. The steps of this ladder, as they appear in experience, are too far apart from each other, and the so-called petty differences between different kinds of animals are in nature commonly so wide separations that no confidence can be placed in such views."*

That he changed his mind later in life his subsequent writings show.

The philosophic mind of the middle and latter half of the eighteenth century dwelt much on the question of man's origin, and conjectures on the subject may be found in the writings of many of the great intellects of the period.

Diderot, writing about the middle of the century, says:

"Imagine the fingers of the hand united, and the matter of the

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* "Critique of Pure Reason." Translated by Meikle John.

nails so abundant that, becoming extended and enlarged, it envelopes the whole; instead of the hand of man, you will have the foot of a horse. When we see the successive changes of the exterior of the prototype, whatever that may have been, approaching one kingdom from another kingdom by insensible degrees, and peopling the confines of these two kingdoms, (if it is permitted to use the term confines where there is no real division,) and peopling, did I say, the confines of two kingdoms with uncertain and ambiguous beings, deprived, in a great measure, of the qualities and functions of the one, and invested with the form, qualities, and functions of the other, *who does not feel himself influenced to believe that there never has been but one first being, the prototype of all beings?*"* A little further on he refers to this theory as being held by Dr. Baumann, but rejected by Buffon, nor does he state whether he himself is a convert to the doctrine. Both Helvetius (1715–1771) and Condillac (1715–1780) advocated the theory of development, and applied it to the moral world as well. The former in his "De l'Esprit," and the latter in his "Traité des Sensations," work out an elaborate system of Utilitarian philosophy, and openly avow Atheistical principles.

Dr. Erasmus Darwin, (grandfather of Charles Darwin,) who attained the highest distinction as physician, poet, and naturalist, writes in his "Zoonomia." which appeared in 1794: "All warm-blooded animals have arisen from one living filament, which the first great cause endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions, and associations; and thus possessing the faculty of continuing to improve by its own inherent activity."

* Imaginez les doigts de la main réunis, et la matière des ongles si abondante que, venant à s'étendre et à se gonfler, elle enveloppe et convre le tout, au lieu de la main d'un homme vous aurez le pied d'un cheval. Quand ou voit les métamorphoses successives de l'enveloppe du prototype, quel qu'il ait été, approcher un règne d'un untre règne par des degrés insensibles, et peupler les confins des deux règnes (s'il est permis de se servir du terme de *confins* où il n'y a ancune division ré elle,) et peupler, dis-je, les confins des deux règnes, d'êtres incertains, ambigus, dépouillés en grande partie des formes, des qualités et des fonctions de l'un, et revêtus des formes, des qualités, des fonctions de l'antre, qui ne se sentirait porté à croire qu'il n'y a jamais eu qu'un premier être prototype de tous les êtres."

Diderot.—"De l'interprétation de la nature."

Here we have a clear statement of the theory of progressive development.

The great German poet, Gœthe, who was no less great as a naturalist than as a devotee of the muses, expressed similar views in his morphological writings published about the same time. But the most important name in connection with the theory of the development of organic life, up to comparatively recent times, is that of Jean Baptiste Lamarck, (b. 1744, d. 1829.) This great Frenchman worked out an elaborate system, which he promulgated to the world in his zoological writings published in the early part of this century.† His views were combated by the celebrated Cuvier, who maintained the permanence of species, and the weight of his great name retarded the progress of the doctrine for many years. The distinguished zoologist, Geoffroy Saint-Hilaire, espoused the cause of Lamarck and ably defended his doctrines.

Lamarck attributed the variations of the animal organism to several causes. He recognized—

First. An internal tendency on the part of the individual towards a higher development.

Second. The power of habit, or the use and disuse of parts.

Third. The influence of the surrounding conditions, as food, climate, soil, &c.

Fourth. The crossing of existing forms.

To these four causes he refers the modification of the organism. In order to explain the existence at the present time of those low forms of life which constitute by far the greater part of the animated creation, he held that spontaneous generation is going on all the time. He failed to recognize the fact that an organism may remain for an indefinite length of time without change of structure, provided the external conditions remain unaltered, and that

* * * †"Je reconnus que la nature, obligée d'abord d'emprunter des milieux environnans la puissance excitatrice des mouvemens vitaux et des actions des animaux imparfaits, sut, en composant de plus en plus l'organisation animale, transporter cette puissance dans l'intérieur même de ces êtres, et qu'à la fin, elle parvint à mettre cette même puissance à la disposition de l'individu."

* * * "alors on eût pu apercevoir comment les besoins, d'abord réduits à nullité, et dont le nombre ensuite s'est accru graduellement, ont amené le penchant aux actions propres à y satisfaire; comment les actions devenues habituelles et énergiques, ont occasionné le developpement des organes qui les exécutent."

it is even possible for the organism to be degraded in the scale by being exposed to *lowering* conditions. It was reserved for Mr. Darwin and Mr. Wallace to elaborate this great truth, thus rendering it no longer necessary to assume that new organisms are constantly being produced spontaneously from inorganic matter. But the age was not far enough advanced to grasp the views of Lamarck during his lifetime, and he died in 1829, in obscurity and indigence, filled with bitterness and disappointment.

About this period, a school of philosophy, founded by the celebrated Saint-Simon, (1760–1825,) attracted universal attention and gained many adherents and admirers, among whom was August Comte, who elaborated the teachings of his master, and founded what is known as the "Positive School of Philosophy." Comte advocated the theory of evolution and applied it to the social world, following in the footsteps of Helvetius, Condillac, and Condorcet. He engrafted the peculiar "spiritual" tenets of his master on his so-called Positive system, and endeavored to establish a kind of religion in which *human nature* was the object of worship. He held that the human mind passes through three stages in its meditations upon all subjects—first, the theological; second, the metaphysical; and third, the positive. In this last stage, the mind is supposed to attain to its greatest power, and to be able to penetrate into the most hidden of nature's processes, and to comprehend all things connected with the laws which govern the Universe. Carrying his system to its legitimate conclusion, he looked upon man as the most exalted thing in the Universe, and therefore worthy of being regarded with all those feelings which constitute worship, and upon this is based his religion of human nature. Many of Comte's most enthusiastic admirers deserted him when this conclusion was reached, and denounced him as a crack-brain visionary, thereby demonstrating their own weakness and inconsistency. They were willing to go with Comte to the length of doing without God in the world, but they shrugged their shoulders in disdain when they were offered the only substitute which Comte had to give as an outlet for those natural feelings which every human being, not entirely besotted and brutalized, is possessed of. Let the atheist, by whatever name he calls himself—whether materialist, monist, or agnostic—ponder well the conclusions of Comte, and from the cogitation his blinded vision may be restored. The

rock upon which Comte was wrecked stands in the track of every *consistent materialist*, *monistic*, or *agnostic*.

In 1844, appeared the "Vestiges of Creation," in which the views of Lamarck were laid before the world in popular form and advocated with great ability. The author announces his belief "that the several series of animated beings, from the simplest and oldest up to the highest and most recent, are, under the providence of God, the results, *first*, of an impulse which has been imparted to the forms of life, advancing them, in definite times, by generation, through grades of organization terminating in the highest dicotyledons and vertebrata, these grades being few in number and generally marked by intervals of organic character, which we find to be a practical difficulty in ascertaining affinities; *second*, of another impulse connected with the vital forces, tending, in the course of generations, to modify organic structures in accordance with external circumstances, as food, the nature of the habitat, and the meteoric agencies, these being the 'adaptations' of the natural theologian."

Mr. Charles Darwin tells us that he began to speculate upon the subject about the year 1837, immediately after his return from a voyage around the world as naturalist on board the *Beagle*. His work on the "Origin of Species by Means of Natural Selection; or, the Preservation of Favored Races in the Struggle for Life," appeared in the year 1859, and it was soon followed by Mr. Wallace's work on the same subject, who had been working independently of Darwin. Their conclusions were essentially the same. In his work on the origin of Species, Mr. Darwin did not apply his theories to man, nor is there anything in the work which indicates that he had any intention of applying it to the human race. In 1863, Mr. Huxley published a work entitled "Evidences of Man's Place in Nature," in which he very ably advocates man's descent from the apes. He demonstrated that the apparent structural differences which separate man from the higher apes are not greater than those which separate the highest ape from the lowest. In 1871, Mr. Darwin published his "Descent of Man and Selection in Relation to Sex," in which he applies the theory to man also.

The chief distinction in the views advocated by Lamarck and Darwin has already been referred to. Both recognized the effects

of habit, or the use and non-use of parts, as a powerful factor in natural selection; both recognized the influence of surrounding conditions in modifying the organism. But Lamarck was possessed with the notion of necessary progression. In advocating the existence of an internal tendency toward development, he was led to believe that the organism *must* progress in spite of external conditions. Mr. Darwin showed that this *linear* development, implied by Lamarck, does not exist, and advocated that the organism may remain stationary or even retrograde, according to surrounding conditions. He also elaborated the great truth of "the survival of the fittest in the struggle for life."

In opposing the *linear* progression of Lamarck, Mr. Darwin was led into the error of discarding the existence of *internal* tendency on the part of the individual to attain to a higher development, though he recognized the existence of an internal tendency to vary. But the existence of an internal tendency to progress to a higher form is not incompatible with *stagnation* or even *retrogression;* for if the *external conditions* are not favorable, the organism will not progress, notwithstanding the existence of an internal tendency in that direction. Both Lamarck and Mr. Darwin failed to recognize the great truth that there has been, and doubtless still is, a *tendency* on the part of *external* nature to prepare itself for the reception of higher forms of life. The Geologic history of the Earth demonstrates this, and the fact that life has progressed, which geology also proves, renders it self-evident that there has been an *overruling tendency somewhere* which has brought about this steady progression. If we deny an innate tendency on the part of the animate world, we must allow it to the external or inanimate world, which, by fitting itself for higher forms of life, has *solicited* and brought about that progressive development. Now, there are numerous *Local* exceptions to this grand general law of the Earth's fitting itself for the reception of higher life, and where these local exceptions occur, there life will not progress—it may remain stationary or retrograde, and even disappear from such localities. This important question will be more fully discussed later.

The name of Mr. Darwin, among English-speaking people, at least, has become so closely identified with the theory of development that it has come to be known as "Darwinism;" but the reader who has perused this brief historical sketch has long since

observed that the growth of the theory of Evolution is an illustration of the doctrine itself. But as it is customary and right to give the first *known* promulgator of a doctrine the credit of discovery, we are in equity bound to designate the doctrine of Descent the Leucippian theory of the Universe, for he recognized the fact that the whole Universe has been developed from preëxisting atoms.

In Aristotle, we see a recognition of the mutability of animal forms, and the possibility of their development into higher forms. Coming down to modern times, we see the theories of Leucippus and Democritus revived by Bruno, and still later by Kant, Laplace, and Herschel.

In the labors of Wolff, von Baer, and others, we are taught the processes of Ontogenetic development, (individual development from the egg.) This great step prepared the way for a comprehension of Phylogenetic development, (Race development.)

To Lamarck, Darwin, Wallace, Haeckle, Huxley, and others, we are indebted for a better understanding of the laws governing this phylogenetic development. The name of Darwin is more intimately associated with the theory of development than any other, for the simple reason that his work appeared at a time when the world was better prepared to receive such theories, and because the general reader, as a rule, knew nothing of the labors of those who preceded him. The laws of development, as applied to the social world, though certainly recognized by the older philosophers, were not elaborated until comparatively modern times. The latter half of the last century was particularly rich in great thinkers on the subject.

The labors of Adam Smith, Diderot, Helvetius, Condorcet, Rousseau, Condillac, and, still later, August Comte and J. S. Mill, are particularly noteworthy. At the present time, the name of Herbert Spencer is more widely known in connection with social development than any other.

The theory of development is now universally accepted by nearly all scientific men as a demonstrated fact, but it has assumed two widely different aspects—the Atheistical, or Monistical, those who have no belief in the existence of a Divine Intelligence; and Theistical, those who recognize the existence of a Supreme Intelligent Deity, the great first cause of all things.

Atheism is represented by the monistic or materialistic philosophy, and the agnostics. The former *positively deny* the existence of an Intelligent Deity, while the latter *do not believe* His existence because of insufficient evidence. Their attitude, therefore, is one of *Passive Negation* and *Positive disbelief.* We are, therefore, justified in classing them as Atheists. Mr. Darwin recognized this when, in a conversation with Dr. Buchner, an avowed atheist, he remarked, "I am with you in thought, but prefer the term Agnostic to Atheist."

Among the most prominent of these agnostics, may be mentioned Mr. Herbert Spencer, Tyndall, Huxley, and Bain; among avowed atheists, Hæckel, Buchner, Vogt, and Clifford.

The author of this work, in the ensuing pages, will endeavor to prove that none of these gentlemen are Evolutionists, in the true sense of the word; but that the philosophy which they teach is a doctrine of *Involution*, and not of Evolution. He will endeavor to show that Evolution and Atheism, agnostic or otherwise, are incompatible with one another. He will attempt to demonstrate that the doctrine of Evolution furnishes the most conclusive proofs of the existence of a Supreme Uncaused Being, distinct from the Universe and the Author of it.

CHAPTER II.

GENERAL CONSIDERATIONS—EVOLUTION DEFINED—SPENCER'S SYSTEM SHOWN TO BE A THEORY OF INVOLUTION · CRITICISM OF HIS THEORIES—AGNOSTICISM—CONCEPTIONS OF THE UNCAUSED BEING—CREATION BY EVOLUTION AND INSTANTANEOUS CREATION COMPARED.

"Let knowledge grow from more to more,
But more of reverence in us dwell;
That mind and soul, according well,
May make one music as before.

But vaster * * * * *"

—*Tennyson.*

The Universe, both material and immaterial, is the handiwork of a Supreme Divine Being, and this Uncaused Being we designate GOD, the Creator and Sustainer of all existing things, the High and Holy ONE who is the object of human worship. This word, God, is of Saxon origin, being a contraction for GOOD,* hence the appropriateness of the word to designate the Supreme Cause of things.

Belief in the existence of a BEING who is not the Universe, but the author of it, lies at the very foundation of all true philosophy, and all the systems of belief which are not so founded are literally built on insubstantial nothing and are destined to fall. The ages are strewn with the ruins of these systems, bearing testimony to the absorbing interest which the great secrets of nature have had for the human mind in all generations. The intellect of man is so constituted by its great artificer that it is constantly reaching out and endeavoring to fathom that which is beyond it; thus every success serves but as a stepping-stone for further conquests, and the "goal of to-day becomes the starting-point for the morrow."

In our own individual lives we see this exemplified. No sooner are we possessed of the object of our desires than we see something beyond which is equally desirable, and this in turn leads to some-

* Among the sages of Greece, the word *Agathon* (the Good) was often used to designate the Supreme One.

thing else; and so the pursuit continues until old age, death, and the grave put a quietus on all.

The history of nations is but a long catalogue of strivings, successes, and defeats. The accumulated experience of one age is made use of by the next, and this by the next, and so on without end. From our vantage-ground of the nineteenth century, we can cast our eye down the long vista of the ages and appreciate the gradual ascent from a primitive savage state to our present condition. No student of history will deny that this age stands higher in the scale of development than any former age of the world. No student of history will deny that the sum of human happiness is greater than at any other period of the history of the world; both in material prosperity and moral well-being we stand at the head of all the centuries that have preceded.

The continual striving upward and onward has slowly but surely developed the infant man, who, destitute of everything except his moral nature that could distinguish him from the brute, cowered in his woody retreat, shuddering and shrinking with superstitious dread, into the strong, reliant, intellectual power that has enslaved nature and made her the willing handmaid of all his undertakings. From an obdurate tyrant, nature becomes an ally and a friend, and, with her assistance, man has become the undisputed lord of all lower creation. The recognition of superior power is the foundation upon which the religious beliefs of all men are based; and the study of the lowest existing savage conditions furnishes us with the clue by which we can follow up the development of religious thought in primitive times and prior to the advent of revelation.

The lowest form of religious belief, taking its origin in the recognition of parental authority, draws its inspiration from the objects and phenomena of the natural world. These, in time, are clothed with distinct personality, and the forces which nature manifests come to be regarded as the will of departed ancestors. The low intellect of the savage man sees in the thunder, in the lightning, in the earthquake, and in the pestilence the exhibition of forces which he cannot comprehend, but in the effects of which he recognizes powers far beyond anything he himself can exercise. As he contemplates the destruction and death following in the footsteps of these phenomena, awe and terror take possession of his soul, and, probably, the first religious observance was an attempt

to propitiate the manes of ancestors symbolized by these natural forces.

His self-consciousness having been awakened by fear, he soon learns to contrast with these terrifying agencies all those benignant influences which directly conduce to his comfort and well-being, and now, for the first time, do the feelings of gratitude and reverence mingle with those of terror and awe, and, at the self-same moment, he propitiates what is hurtful in nature and renders true worship to that which is beneficial or good. Of all the objects in nature, the sun would be the first to command these feelings of reverence and gratitude. Not only is it the most conspicuous of natural objects, but it is the ruler of day, the dispeller of darkness, the source of light and heat, the great vivifier of all animated nature. It is not surprising, therefore, that the sun should generally hold the first place among the innumerable deities of the early savage state. The savage mind has now learned to discriminate between good spirits, or those agencies from which it receives benefits, and evil spirits, from which it receives nothing but harm. To the first, true worship, based on reverence and gratitude, is rendered; but the latter is regarded with fear and terror, and here religious observance takes the form of propitiation. As the savage intellect develops and its knowledge becomes more extended, this indiscriminate worship of natural objects and forces is narrowed down, and only the more important of these agencies continue to influence the mind. These are gradually clothed with distinct personality, and an elaborate *Polytheism*, such as the early history of every nation affords, is the result. It is questionable whether the human mind would ever have attained to a knowledge of the one Supreme Being, pure monotheism, without a special revelation. However that may be, the believer in Holy Writ knows that such a revelation was made, and with that revelation the historical period of the human race commences. Whatsoever opinion may be held as to the authorship of Genesis, this is certain, that it transcends in antiquity all other writings which have come down to us. Moses, the reputed author, lived about 1500 B. C. The best authorities do not ascribe as high an antiquity to the Rig Vedas of the Hindoos, which is placed from 1000 to 1400 B. C.

The distinguished archæologist, Mr. George Smith, is of the opinion that the legends of the Assyrian tables were written be-

tween 1500 and 2000 B. C. If we accept this, we must regard Moses as a compiler of knowledge that existed before his time. The Zendavesta, or sacred writings of the ancient Persians, supposed to have been compiled by Zoroaster from more ancient writings, is placed from 600 to 1000 B. C.

There is every reason to believe that the monotheistic conception of the Hindoos, involved in the idea of *Brahm*, or Divine Essence of things, was derived from the same source from which the Jews received their conception of one Supreme Being. The same is doubtless true of the Divine Essence, recognized in the Zendavesta, and there called Zernane Akerene. The pure monotheism of the Hindoos degenerated later into the *Triad*, consisting of Brahma, (not to be confounded with Brahm,) Vishnu, and Siva. Brahma was the creator, Vishnu the preserver, and Siva the destroyer. This trinity of gods came to be the foundation of the Brahminic religion and the objects of universal worship among them. The pure spiritual ideal involved in the conception of Brahm or the Divine Essence, the source of all things, was gradually confounded by the speculative Hindoo mind with the material Universe, and this gave a pantheistic turn to what was originally a pure spiritual monotheism. In the religion of the Zendavesta, the Divine Essence of things was also gradually lost sight of and two opposing deities came to be recognized: Ormuzd, or the Good, and Ahriman, or the Evil. Ormuzd is supposed to have sprung from the Divine Essence and to wage perpetual war with Ahriman, whom he is finally to overcome. It is obvious that these two names originally were only intended to symbolize the good and evil in the world, but eventually they became clothed with distinct personality and to be worshipped as deities. Later on, the system became still more corrupted, and fire, which was originally a symbol of the Divine Essence, came to be worshipped. In the fire-worshippers of modern times, we behold the relics of the religion taught by Zoroaster.

The conception of one Eternal and Supreme Essence, the Creator of all things, and the one Being to whom all reverence and homage are due, is evidently from one source, and this unity of origin seems to indicate that it was in some way a special revelation rather than a revelation by a natural course of intellectual development and refinement of existing polytheistical ideas.

The early Greek philosophers obtained their conception of one Supreme Intelligent Being from their communication with the Eastern nations. Thales, (640 B. C.—545 B. C.,) the founder of the earliest Greek school of philosophy, spent years of study in Egypt and Asia, and brought back with him not only the knowledge of external nature, but also their conception of a Supreme Being.

The transition from the Monotheistic conception to Pantheism or Materialism was a gradual one. When man was once fully awakened to the study of nature and her methods, it was not long before he recognized the chain of sequence of cause and effect observable in all her operations. The study of the secondary causes of nature gradually withdrew the mind from the contemplation of a Primal cause, or Spiritual Ideal, and Materialism, or Pantheism, was the natural result. This Pantheistic conception of things found its way to Greece, or originated there, being the result of the same causes which had influenced the Hindoo mind.

Materialism, in some form or other, seems to have replaced, in a great measure, the conception of a Divine Intelligence in the philosophic mind of Greece. The philosophy of Socrates brought the speculative mind back to the contemplation of the Spiritual or Ideal. He suffered the punishment of death for teaching his new doctrine, and for ridiculing the popular gods of his country. Plato continued the teachings of his master, and everywhere in his writings insists on the existence of a Supreme Intelligence. His pupil, Aristotle, in his physics, attempts a logical proof of the same. But notwithstanding the triumphant vindication which the domain of the spiritual received at the hands of these profound thinkers, the hydra-headed doctrine of materialism has survived to this day.

In the philosophy of Hæckel, Spencer, Huxley, and their followers, we behold the old ideas of Greece once more lifting their heads; and at no time, since the palmy days of the French Encyclopedists, has it enlisted a greater number of disciples. But Atheism in all its forms, whether we call it Monisticism, Pantheism, Materialism, or Agnosticism, is doomed to bring about its own destruction. The demise of the Positive School, under the leadership of August Comte, in a whirlwind of ridicule, is destined to overtake the Monistic School of to-day. The only difference in

the philosophy of Comte and that of Spencer and Hæckel is that Comte carried his philosophy to its legitimate conclusions, and endeavored to establish a kind of religion in which *human nature* was the object of worship. The absurdity of the thing was so glaring that Comte was credited with having lost his senses, and many of his followers deserted and denounced him. And yet, if agnosticism be sound philosophy, Comte was in the right; he simply recognized in man the most exalted and most dignified being in the Universe, the *climax* of an indefinite period of development, and rightly took the ground that such a being merited the most august consideration. Now, as no individual man could be selected who united in his single person all the virtues of the race, he was compelled to take human nature in the abstract as an object of worship. Comte, in establishing his religion of human nature, was but following the promptings of that something within us which demands an object upon which to lavish, without conditions or limitations, our feelings of gratitude and reverence. His understanding, failing to penetrate the veil of material nature, and to attain to a knowledge of the one Supreme Intelligence, was compelled to select the most perfect thing within reach, and that thing was human nature.

Comte is to be pitied, for the noblest side of his nature—the moral side—was led astray by his understanding. What his inconsistent followers called his great errors, and ridiculed him accordingly, really became the *redeeming features* of his philosophy; and, in their existence in such a system of thought, we see vindicated the noblest and most exalted side of human nature—that side which includes all the higher emotions of the soul: reverence, veneration, gratitude.

The *inevitable* result of a genuine and vital belief in the existence of a Divine Supreme Personality, from whom all things are suspended, is the calling forth of all those feelings which constitute true worship; and if these feelings are wanting, it is demonstrative proof that the individual has no real profound conviction of the existence of such a Being, though he may profess such a belief in words. The greatest exponents of the atheistical philosophy of the day are those who have done most to establish the doctrine of Evolution; and in this doctrine of Evolution, which they have done so much to establish, their own *discomfiture stands revealed.* The doc-

trine of Evolution carries with it *demonstrative proof* of the existence of a Divine Supreme Intelligence, and in the following pages it will be the aim of the author to show that Atheism and Evolution are absolutely contradictory and incompatible with one another.

The study of nature affords the highest exercise of those powers of the mind which distinguish us from all the lower creation; it elevates our conception of the attributes of that Being upon whom it all depends, and it broadens our character and understanding, and deepens our affections. The great Galen was wont to call his anatomical writings a hymn of praise to the Supreme Being. The greatest intellects of all ages and nations have been distinguished for their devout spirit and veneration.

The study of nature is the study of the laws of the Great First Cause. These laws may be divided into two classes, PRIMAL and SECONDARY. Secondary laws are an observed order of facts, standing in the relation of cause and effect to one another, and are, therefore, subject to analysis. Primal laws can only be defined as *simple decrees.* It may never fall to the lot of a created being, in its study of the universe, to come face to face with Primal law, for the infinite resources of the Creator can hang law upon law until the series, to a created intelligence, is practically infinite. Kepler's three laws, in their relation to one another and to the law of universal gravitation discovered by Newton well illustrate a series of dependent secondary laws, or an observed order of facts. Kepler discovered his laws by observation and as an independent order of facts, and their mutual relations were not fully appreciated until the law of gravity demonstrated how closely they were bound together. Again, the sun's heat evaporates the waters of the earth, and they rise in the air and form clouds; these clouds are finally precipitated in rain, and the rain-fall causes animal and vegetable life to flourish. Here we have an observed order of facts dependent upon one another as cause and effect. But it must not be overlooked that each individual fact here mentioned, whilst it depends upon the *preceding fact*, also depends upon other causes. Thus, the sun's heat could not evaporate the water unless its chemical nature allowed such a change; nor would the clouds so formed be precipitated in rain were it not for a lowered temperature and the action of the law of gravity; nor would the rain, when it reaches the earth, have any effect upon animal and vegetable life

were it not that numerous other laws, chemical and vital, came into play to bring about that result.

We are thus enabled to formulate two great facts observable in natural processes:

1. *Every cause is the occasion of setting on foot more than one train of cause and effect.*

2. *Every effect is the result of more than one train of cause and effect.*

The recognition of these two facts enables us to appreciate that the *secondary* laws of the Universe stand in the same relation to primal law that the branchlets and branches of a tree do to the common trunk, and this common trunk, in its turn, has its origin in the Great First Cause, the Creator and Supporter of all things.

The Universe has been created by one of two methods: either by a process of *Evolution* or by an *immediate act* without the intervention of *secondary laws*. The study of nature teaches us that law reigns throughout, and, reasoning from analogy, we ought to expect that the Universe was brought to its present state through the agency of law. It will be the effort of the author of this book to prove that God created the Universe by an evolving process, and not by what is known as *special* or immediate creation. The former is just as much a creation as the latter, the only difference being that in the former it was done through the agency of innumerable secondary laws and involved vast periods of time, whilst in the latter it was direct and instantaneous.

Before entering upon the study of the merits of these two methods, we must have a clear idea of what we are to understand by the term "Evolution."

The word Evolution (from Latin *evolutio*) in its true significance means an *unfolding*, and is just the reverse of Involution, (Latin *involutio*,) which signifies the process of being *enwrapped* or *enfolded*.

If the true meaning of the word Evolution be retained, when we consider it in its relation to the development of the material Universe, it is obvious that the word carries with it an implication of the prior existence of that which is being evolved. In other words, Evolution implies previous Involution, and the latter is *the measure* of the former. Evolution cannot exceed Involution—that which is not involved cannot be evolved.

The process of Involution to Evolution is therefore an unfolding of that which previously existed, but which was hidden from sight.

Evolution *simplifies*, for it lays bare and enables us to comprehend what was before involved or complicated. Thus we see that the *complex* is the *involved* and the simple the evolved.

The passage, then, from the complex to the simple is what constitutes Evolution.

This conclusion may cause a smile of incredulity in those who have been in the habit of accepting without question the dictum Mr. Spencer has laid down, that "the process of Evolution consists in a change from the simple to the complex," or, to put it in another way, "from the homogeneous to the heterogeneous."*

A little thought is sufficient to show us that such a use of the word Evolution is a gross perversion of the true significance of the term. The process he describes is one of Involution, not one of Evolution. According to his dictum, things are becoming more and more involved or complicated. Surely, the proper name for such a philosophy as this is that of Involution.

This confusion has arisen in Mr. Spencer's mind from the habit of calling that which is *complex* simple, and designating what is *simple* complex. For example, Mr. Spencer would tell us that an egg is *simple* as compared with the developed chick, which he would designate as *complex*. But when we penetrate beneath the surface of things, are we justified in calling the egg simple as compared with the fully-developed chicken? The word simple as applied to the egg is a shallow and common use of the word, for it utterly ignores those hidden laws or tendencies through the action of which the albuminous mass is converted into a bird, and only refers to those superficial parts which can be *determined* and *comprehended* by the senses. But when we penetrate beneath the surface of things with the eye of reason—for here the microscope and the scalpel avail us naught—we are compelled to regard the fertilized egg as the most complicated of things. In the narrow compass of its albuminous mass, we recognize the *potential* existence of the fully-developed chicken, with all the arteries, nerves,

* This definition is not new with Mr. Spencer, but was formulated by the celebrated Von Baer. With him it was used merely as a morphological generalization of *tangible* things. In Mr. Spencer's hands, it becomes the basis for a cosmogony.

muscles, bones, and all the other organs which enter into its make-up. The numerous *laws* or *tendencies*,* which stand in the place of overseers to the atoms and molecules of this mass, render it far more complex than the developed chick, for these laws or tendencies are completely hidden from us and no analysis in our power can make them apparent: but the warmth of the mother's body soon begins to clear up the complex mass; one after another the organs make their appearance, and in a few weeks the transformation is complete and we have a fully-developed chicken in place of the yellow and, *apparently*, homogeneous mass we had before. We understand now what we did not so much as guess (supposing we had never seen nor heard of such a transformation); Evolution has *simplified* the complex constitution of the egg, and rendered apparent what was before completely buried out of sight. The egg has literally been *unfolded*, and we now read without difficulty where before a blank greeted us. If we take any one of the numerous organs of which the developed chicken is composed and analyze its constitution, we may justly wonder at the number of parts which enter into its make-up, but how much more must be our appreciation of the complex nature of the egg which comprehended it all. We must not confound this potential *existence* in the egg of all the parts of the developed creature with the theory of *encasement* or *material existence* of each individual organ on a *minute scale*, as was held in the last century by Haller and others. But the presence of the laws or tendencies render the egg even more complex than if each organ had material existence on a minute scale.

Let us then be careful and not confound *true complexity* with that which only depends on qualities which are *appreciable* by the senses. In the ovum all is so *complex* and involved that we know nothing about it, or, as Mr. Spencer would put it, "it is so simple that it can be described in a line;" but in the fully-developed man everything is revealed to us, simplified, laid out before us, so that a volume may be written.

Mr. Spencer, and those who think with him, quietly ignore in their definition of Evolution those laws through whose influence

* As it is certain that all these laws or tendencies are represented by peculiarities of *molecular* structure, the complexity of the egg, even from the standpoint of the materialist, is something beyond all conception.

the dead matter of the Universe has been built up into the wondrous edifice which we see around us. But let it be remembered that the atoms are to the Universe what the bricks are to the house. The bricks which lie promiscuously scattered around cannot aggregate themselves into a house without the intervention of something outside of them. The mind of man and his mechanical contrivances stand in the relation of primal and secondary laws to these dead bricks, and through the workings of these laws the bricks are made to assume that relation towards one another which we call a house. Now, the bricks themselves remain exactly the same, but their relations to one another are so entirely changed that where before we had a scattered pile of bricks we now have a magnificent temple, beautiful and symmetrical in all its parts. Now, the *true nature* of the house does not reside in the individual bricks, *for they remain unchanged*, but it exists in the FORM which they are made to *fill up*. The individual bricks, therefore, only subserve the purpose of *making apparent to the senses* the FORM or IDEA which previously existed in the mind of the architect alone—the house is the shadow of his mind projected upon matter—the outlining of a pure ideal with dead matter.

Let us apply this great truth to the various FORMS which matter takes in the material Universe. It will thus be seen that the secondary laws whose existence Mr. Spencer wholly ignores in his definition of the simple are all important in the Universe, for it is through their agency that the dead atoms are made to assume those various relations which are apparent to our senses. It must be remembered that the atoms themselves *undergo no change*, their relations to one another are only altered. Further, it is obvious that, as far as any change in the atoms themselves is concerned, the *Universe is the same now as it was in the beginning of things.* It may, therefore, be truly held that the Universe must have pre-existed in FORM or IDEA, which the atoms (like the bricks in a house) make apparent to our senses. It is, therefore, obvious to the most superficial understanding that the laws of nature constitute the Universe as we conceive of it, and are therefore *all important* when we come to formulate what is simple and what is complex. When Mr. Spencer defines the egg as *simple*, his definition utterly ignores the existence of those tendencies upon which the real nature of the egg depends and which insure the building

up of the animal structure. His definition can have no reference to these laws, for, if it had, by what process of reasoning could he arrive at the conclusion that the egg is simpler than the being which it produces? The egg of a human being produces a human being, the egg of a dog produces a dog, yet, in microscopic and chemical characters, the two are so nearly alike that they cannot be distinguished! What inference are we to draw from this? The complex constitution of each egg is simplified during the evolving process—the laws governing each make themselves manifest by compelling the atoms to assume certain relations—and in the one case a man, in the other a dog, is the result. It is, therefore, evident that any definition of Evolution which ignores the existence of these hidden tendencies, and which embodies such erroneous ideas of the simple and the complex, is worthless.

Mr. Spencer formulates several definitions of Evolution—thus, on page 360, *First Principles*, he says: "*Evolution is definable as a change from incoherent homogeneity to a coherent heterogeneity, accompanying the dissipation of motion and integration of matter.*" On page 396 of the same work, he tells us that "*Evolution is an integration of matter and concomitant dissipation of motion; during which the matter passes from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity; and during which the retained motion undergoes a parallel transformation.*" He elsewhere formulates it thus: "*Evolution is a change from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity, through continuous differentiations and integrations.*"

The key-note to all these various definitions is that Evolution consists essentially in a change from a state of simplicity to a state of complexity. This he renders clear in many passages throughout his works. Here is a random quotation from "Progress, its Law and Cause:"

"It is settled beyond dispute that organic progress consists in a change from the homogeneous (simple) to the heterogeneous, (complex.) Now, we propose to show that this law of organic progress is the law of all progress. Whether it be in the development of the earth, in the development of life upon its surface, in the development of society, of government, of manufactures, of commerce, of language, literature, science, art, this same evolution of the

SIMPLE into the COMPLEX through successive differentiations holds throughout."

Again, on page 362, F. P., he says: "At the same time that Evolution is a change from the homogeneous to the heterogeneous, it is a change from the indefinite to the definite. Along with an advance from *simplicity* to *complexity*, there is an advance from confusion to order—from undetermined arrangement to determined arrangement."

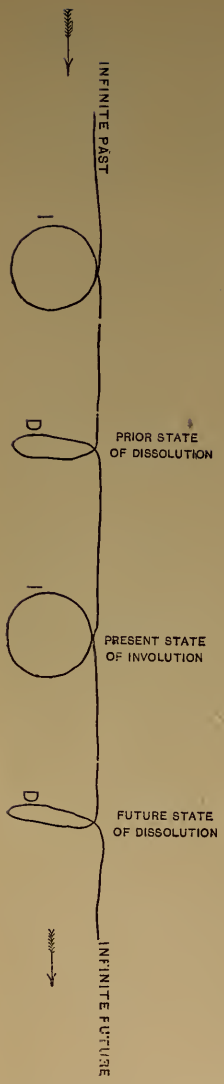
Would Mr. Spencer have us believe that the egg of the animal and the seed of the plant, with their wondrously complex and delicate molecular adjustments, are *confused* masses of undetermined arrangements?

These last passages leave us in no doubt as to what he means to convey in his definition of Evolution if we were uncertain before. While his definition is worthless as defining Evolution, it is a correct definition of INVOLUTION, for it embodies the idea which he wishes to convey "that through all time there has been an ever-growing complication of things," or, in other words, things are becoming more and more involved. Mr. Spencer himself recognizes the inappropriateness of the word "Evolution" to express his system of belief. He says, (First Principles, page 285–286,) "As ordinarily understood, to evolve is to unfold, to open and expand, to throw out, to emit; whereas, as we understand it, the act of evolving, though it implies increase of a concrete aggregate, and in so far an expansion of it, implies that its component matter has passed from a more diffused to a more concentrated state—has contracted. The *antithetical* word Involution *would much more truly express the nature* of the process; and would, indeed, describe better the secondary characters of the process which we shall have to deal with presently." He goes on to explain why he uses the word Evolution instead of Involution, by saying that the word Evolution "is now so widely recognized as signifying not, indeed, the general process above described, but sundry of the most conspicuous varieties of it, and certain of its secondary but most remarkable accompaniments, that we cannot now substitute another word." If Mr. Spencer insists on calling his system by a name which expresses ideas diametrically opposite to what that system teaches, thereby monopolizing a word which has been and still is used to express a system of philosophy which is as widely sun-

dered from his as the two poles are from one another, he must not be surprised if the charge of inconsistency be brought against him. The absurdity of applying the term Evolution to a process which leads to Involution or complexity is too apparent to require further comment. We must, therefore, designate Mr Spencer's philosophy by its proper name, and call it the doctrine of INVOLUTION.

By the light with which this word Involution floods his system, we are enabled to penetrate the veil of sophistry in which it is enfolded. Mr. Spencer uses the word Dissolution as antithetical to Involution, and to express that state of things which preceded Involution. According to him, "Involution and Dissolution together make up the entire process through which things pass, (First Principles, p. 543.) On pages 536 and 537, he says: "Thus we are led to the conclusion that the entire process of things, as displayed in the aggregate of the visible Universe, is analogous to the entire process of things as displayed in the smallest aggregates. Motion as well as matter being fixed in quantity, it would seem that the change in the distribution of matter which motion effects, coming to a limit in whichever direction it is carried, the indestructible motion thereupon necessitates a reverse distribution. Apparently, the universally co-existent forces of attraction and repulsion, which, as we have seen, necessitate rythm in all minor changes throughout the Universe, also necessitate rythm in the totality of its changes—produce now an immeasurable period during which the attractive forces predominating cause universal concentration, and then an immeasurable period during which the repulsive forces predominating cause universal diffusion—alternate eras of Involution and Dissolution. And thus there is suggested the conception of a past during which there have been successive Involutions analogous to that which is now going on, and a future during which successive other Involutions may go on—ever the same in principle, but never the same in concrete result."

Carrying out this thought, he says, page 551: "* * If we are hence compelled to entertain the conception of Involutions that have filled an immeasurable past and Involutions that will fill an immeasurable future, we can no longer contemplate the visible creation as having a definite *beginning or end* or as being ISOLATED. It becomes unified with all existence before and after."



This system of thought, then, calls upon us to contemplate the TOTALITY of existence as consisting of alternate states of Dissolution and Involution, and the cycle passed through from the commencement of a period of Involution to the completion of the subsequent period of Dissolution constitutes a rythmic pulsation of the totality of BEING.

This notion may be diagramatically expressed by a cycloidal curve, in which the larger loops correspond to his periods of Involution and the smaller ones to his periods of Dissolution.

The reader will observe that these successive states of Involution and Dissolution are alternately cause and effect for one another. Nor can one be given precedence over the other, either in past existence or in future existence; both alike extend to an *infinite* past and both will succeed one another to an infinite future. In point of dignity in the scale of being, there can be no distinction between them, for both are co-equal and co-eternal. His belief in the uncaused nature of matter and denial of a definite beginning to the visible Universe,* and his statement that we are not to look upon it as isolated (in the sense of being different) from the ultimate power, but, as identified with it, leaves him but one thing to do, and that is to regard the visible Universe as this ultimate power itself. His system is, therefore, pantheistical, and the successive periods he describes under the names of Involution and Dissolution are merely varying MODES of the ONE BEING—the rythmic pulsations of his Universe GOD.

* Mr. Spencer says (P. Biology): "The creation of matter is inconceivable—implies a relation between something and nothing, an *impossible* relation." He uses the word *inconceivable* in the sense of *incredible*, as is apparent from the context.

It is now a legitimate scientific conclusion that the material Universe does undergo alternating phases of dissolution and reconstruction. But when Mr. Spencer makes ALL EXISTENCE pass through these states, his great error is at once apparent. This notion of the perpetual *waning* and *waxing* of things is not new, and is embodied in that saying, common with some of the old Greeks, that "*Generation is in quality a change;*" or, as Heraclitus affirmed, "*All existence is in a perpetual flux and reflux.*" And Empedocles, in his poem on the nature of things, asserted of the material Universe that "there is a periodical generation and dissolution of things," as is evident from the following lines, translated by Taylor:

"For now, from many, one alone increased,
And then the many from the one arose,
And mortals were assign'd their birth and their decay.
For this, the congress of the whole of things
Led forth to light, and, when produc'd, destroyed.
And this, when forms have into light emerg'd,
Again divides them into parts minute,
And gathers them again. These two, throughout
Diversified, are doom'd to endless change.
All things in union now thro' love conspire,
And now, thro' strife divuls'd, are borne along.
Hence, when again emerging into light
The one is seen, 'tis from the many form'd."*

Notwithstanding the fact that his system is pantheistical, Mr. Spencer still seems to recognize a First Cause, which is a contradiction in terms, unless we accept the absurdity that a thing can cause itself. Moreover, a Pantheist cannot consistently recognize such things as "Fundamental Realities," "Ultimate Powers," and the like, for to him *every part* of the Universe is as fundamental and as ultimate as every other.

As a Pantheist, Mr. Spencer is inconsistent, and to Monotheism his system is absolutely antagonistic. In "First Principles," (p. 552, s. 192,) we read: "Towards some result of this order, (the unification of all existence,) inquiry, scientific, metaphysical, and theological, has been, and still is, manifestly advancing. The coalescence of polytheistic conceptions into the monotheistic concep-

*Empedocles of Agrigentum, (504–443 B. C.,) one of the most celebrated physicians of antiquity and a disciple of Pythagoras. His wonderful cures caused him to be considered the confidant of the gods.

tion, and the reduction of the monotheistic conception to a more and more general form in which personal superintendence becomes merged in *universal immanence*, clearly shows this advance. It is equally shown in the fading away of old theories about '*essences*,' '*potentialities*,' * * 'Preëstablished Harmonies,' and the like; and in the tendency towards the identification of Being as present to us in consciousness (the I,) with Being as otherwise conditioned beyond consciousness." The drift of all this is unmistakable. The expression "*universal immanence*" is put so glaringly in opposition to "Monotheism" as to render all misconception as to his true meaning impossible. Were it not for this, and for passages already quoted, the expression might be interpreted as conveying the same ideas as the phrase "Omnipresence and Omniscience of the Deity," so commonly used by those who believe in a Creator. It is not surprising that a very distinguished English writer characterized Mr. Spencer's system as having "the incurable defect of fundamental incoherence." To reconcile his inconsistencies would, indeed, be a task, compared with which the twelve labors of Hercules are mere child's play.

Thus he tells us (*Progress: its Law and Cause*) that "universally the *effect* is more *complex* than the *cause*." The inevitable conclusion which flows from this statement is that the First Cause of the Universe is simpler and lower in the scale of being than the *thing to which it gave existence!!!*

The Universe, having its cause in an infinite simplicity, is to continue on to a never-ending complexity; for he seems to think that every succeeding period of involution will be more complex than its predecessor. According to this view of things, what becomes of the favorite tenet of this school of thought, embodied in the words "*Ex nihilo nihil fit?*" The doctrine starts with the utmost simplicity and ends in an infinite complexity; it, therefore, pre-supposes *a constant coming into being independent of causation*, for the cause it postulates is, by its own statement, inadequate to bring about the effect.

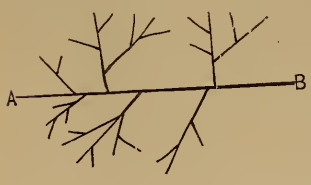
It is patent to the most superficial understanding that a cause cannot give rise to anything superior to itself—what is not *involved* in the cause cannot be *evolved* in the effect.

The absurdity into which Mr. Spencer's reasoning led him is a good illustration of how a man may become the slave of a train of

thought; instead of guiding and controlling it, it gets the upper hand, and leading on, from sophistry to sophistry, finally ends in the most palpable absurdities. Those who wish to follow the train of argument by which Mr. Spencer arrives at the conclusion that effect is more complicated than cause, can do so by reading his exposition on "Progress: its Law and Cause." He is there led into the error of mistaking *part* of a cause for a *whole* cause, and reasoning accordingly. After citing what he calls *the law* of all progress, which is essentially the first law stated a few pages back, and which he formulates thus: "*Every active force produces more than one change—every cause produces more than one effect*," he proceeds to illustrate its working by the following, as well as by other examples: "Take, again, the lighting of a candle. Primarily, this is a chemical change consequent on a rise of temperature. The process of combination having once been set going by extraneous heat, there is a continued formation of carbonic acid, water, etc., in itself a result more complex than the extraneous heat that first caused it. But, accompanying this process of combination, there is a production of heat; there is a production of light; there is an ascending column of hot gases generated; there are currents established in the surrounding air. Moreover, the decomposition of one force into many forces does not end here: each of the several changes produced becomes the parent of further changes. The carbonic acid given off will by and by combine with some base; or, under the influence of sunshine, give up its carbon to the leaf of a plant. The water will modify the hygrometric state of the air around; or, if the current of hot gases containing it come against a cold body, will be condensed: altering the temperature, and perhaps the chemical state, of the surface it covers. The heat given out melts the subjacent tallow, and expands whatever it warms. The light, falling on various substances, calls forth from them reactions by which it is modified; and so divers colors are produced. Similarly, even with these secondary actions, which may be traced out into ever multiplying ramifications, until they become too minute to be appreciated. And thus it is with all changes whatever. No case can be named in which an active force does not evolve forces of several kinds, and each of these, other groups of forces. *Universally the effect is more complex than the cause.* Doubtless the reader already foresees the course of the argument. This multiplication

of results, which is displayed in every event of to-day, has been going on from the beginning; and is true of the grandest phenomena of the Universe as of the most insignificant. From the law that every active force produces more than one change, it is an inevitable corollary that through all time there has been an ever-growing complication of things."

It will be seen that the error into which Mr. Spencer has fallen is the result of a narrow conception of what constitutes causation. In recognizing the first law of progress, he ignores the second, which is: *Every effect is the result of more than one train of cause and effect.* Is it true, as he tells us, that the single act of lighting a candle is *the* cause of the many effects which he details? A little thought will show the fallacy of this statement. The truth is that every effect mentioned is the result of numerous *other* causes, each one as potent as every other in bringing about the final effect. Thus, the formation of carbonic acid, water, etc., which followed the consumption of the candle, could not have resulted had not certain chemical laws existed which permitted of such a transformation. Nor could the carbonic acid so formed have united with a base had it not been for its affinity for that particular base, and for its presence in the vicinity. Nor could it have given up its carbon to the leaf of a particular plant, had it not been for the multitudinous chain of causes, of a physical and vital nature, far too intricate and obscure to trace. It is, therefore, obvious that *the* cause which led to the lodgment of a carbon particle belonging to the burning candle in the leaf of a particular plant is a most *complicated* cause, consisting of many causes, all independent, but which have inosculated, or run into, one another in the production of the final effect. This may be better understood by the following diagram, where the burning candle, one of the factors of the *compound* cause which led to the lodgment of the carbon particle in the leaf, is represented by the twig *A*. The other twigs represent the *other* numerous and obscure factors whose existence was necessary to the final result, *B*.

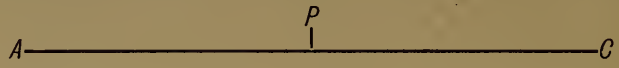


Had not Arletta's pretty feet, twinkling in the brook, fascinated Count Robert, the Devil, William the Conqueror would not have been born; the battle of Hastings would not have been fought;

no Anglo-Norman dynasty would have reigned, and England of to-day would be very different from what it is; ergo, the cause of England's present greatness is to be attributed to Arletta's pretty feet twinkling in a Norman brook, on a summer's day, some eight hundred years ago. While it is undeniable that Arletta's pretty feet are very important factors of the very complicated *cause* of England's present greatness, yet I hardly believe that any man who prized his reputation as a thinker would hazard the assertion that England's present greatness is due to Arletta's pretty feet. How many antecedent, contemporaneous, and subsequent events, all as potent, and all entirely independent of Arletta's pretty feet, have conduced to the grand result? Who would have the hardihood to attempt to trace *the cause* of England's present greatness? This illustration, comical though it be, is, in all respects, similar to the preceding, and teaches on an exaggerated scale what it does on a smaller. If Mr. Spencer should still insist that the burning candle is *the cause* of the carbon particle being in the leaf, then, with equal reason, he must hold that to Arletta's pretty feet must be attributed the present greatness of the British Empire.

So far from Mr. Spencer's statement being true, "that universally effect is more complicated than cause," the converse is universally true. What is not *involved* in the cause cannot be *evolved* in the effect, is an axiom as well grounded as any in geometrical science. Even he who rejects belief in a Divine Being, the Author of the Universe, is compelled to accept this as truth. From the point of view of the atheist or pantheist, ALL BEING, being an uncaused existence, must be looked upon as a sequence of events, standing in the relation of cause and effect, extending back into a *beginningless* past, and stretching out into a never-ending future. Every effect, at the moment of its birth, becomes itself the cause of other effects; and thus every event that occurs in the Universe is alternately effect and cause. Considered as an *effect*, every event is the apex of a pyramid of causes and effects which has a base of infinite dimensions laid upon an eternal past; considered as a *cause*, it is the apex of a pyramid whose basal lines broaden with its progress into futurity; but infinite futurity being unattainable, the base of the latter *can never equal* in dimensions the base of the former. Now, what is true of any single event is true of all events whatsoever; is, in a word, true of the whole Universe at any point of its

duration. It, therefore, necessarily follows that the period of duration which the Universe has already fulfilled can never, by any possibility, be equaled in the future, endless though that be. In other words, to the pantheist, the *past history* of the Universe is greater than its future history can possibly be, and this is susceptible of mathematical demonstration. Let the line *A C* represent



duration, without beginning and without end. Let *P*, being the present, represent any point on this line. Now the line *A P*, which represents the past duration of the Universe, is *endless* in the direction of *A;* but the line *P C*, which represents endless future duration, can never be passed over, for the point *C* nowhere exists, and, therefore, can never be reached. The past has come up to us from the infinite, but the future can never attain to the infinite. The mathematician disposed to split mathematical hairs might affirm that it could be reached in an infinite time, but, manifestly, infinite future time can never be realized. The future, therefore, regarded as an effect of the past, can never equal this past in the number of its events; in other words, its complexity. Thus we see that Mr. Spencer's statement, even when examined from the stand-point of the pantheist, is without any foundation in fact.

Furthermore, from what has preceded, it necessarily follows that the Universe is to be looked upon by the pantheist merely as a mass of matter and force, *flowing* along the line of infinite duration. As it is now a well-established law of the physical world that matter is indestructible, and that the *original* store of force cannot be added to, it results that, if this mass be examined at *any point of its course along the line of endless duration*, it will be found to consist of precisely the same number of atoms, moved by precisely the same forces, acting in precisely the same way, inducing the same adjustments, and, therefore, manifesting the same degree of complexity. In other words, the Universe of ten millions of years back was of the same complexity as that of the present; and the Universe of ten millions of years hence will show no increase of complexity. For, were it otherwise, did this mass of atoms and force present degrees of complication at every point of its march along the line of duration, it would argue the coming

into being of *something new* at every step of the way, bringing about this perpetual change and increasing complexity. But the pantheist cannot consistently recognize the coming into being of any such new comers. Thus the constant change which we see taking place in the Universe around us is, itself, a refutation of pantheism. "To subsist always according to the same, and in a similar manner, and to be the same, belongs to the most divine of all things alone. But the nature of body is not of this order." *

According to this system, then, the Universe is becoming more and more complex, more and more involved. It is not surprising, therefore, that many of those who accept this philosophy should look to man as the most exalted being in the Universe, the noblest aggregation of atoms, and should render unto him that homage due his exalted position. Comte recognized this, and Professor Clifford also seems to enter into the true spirit of this philosophy when he speaks of "Father man looking out from the dim dawn of history, with the fire of eternal youth in his eye, crying out, before Jehovah was, I am." In spite of the "dirt philosophy" which they advocate, it has not been powerful enough to destroy all sentiment in their bosoms, and the better part of their nature tries to assert itself.

The Universe must be looked upon either as the Uncaused Being itself, or as the *expression* of the WILL of this Uncaused Being. From this there is no escape. Enough has been said to show that Mr. Spencer's theory of Involution cannot be accepted by any one who believes in the existence of an Uncaused Being distinct from the Universe, that is, a Creator.

But the doctrine of *true* Evolution teaches that all things are suspended from such a Being, and that the Universe around us is the embodiment of His will. The atoms of matter which He created He also endowed with the laws which have compelled them to assume those numerous relations which we call the Material Universe.

In assuming these relations, the atoms reveal to us the Laws which govern them, and this is what Evolution consists in. The writer would, therefore, suggest the following as a definition of Evolution: IT IS A CHANGE FROM THE COMPLEX TO THE SIMPLE—A PROGRESSIVE UNFOLDING OF CAUSE INTO EFFECT. This scien-

* Plato, in the "Statesman."

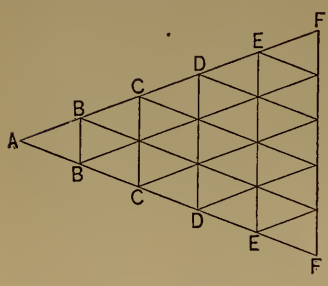
tific definition naturally merges into the transcendental definition that *Evolution is the unfolding of the will of the Uncaused Being.*

It is obvious that the process only becomes possible in the Material Universe when there are SUPERIMPOSED laws to be made manifest. Mr. Spencer's theories will be found wanting whether we test them from the stand-point of Theism or from the stand-point of Pantheism.

Theism asserts that there is an Uncaused Being, not the Universe, but the Author of it; Pantheism holds that the Universe is itself the Uncaused Being.

By the first hypothesis, the Universe, being a *caused* thing, must have had a beginning.

Let *A* represent the *Fiat* of the Uncaused Being to whom the Universe owes its existence, and let the lines *B B*, *C C*, *D D*, *E E*, *F F*, represent the Universe at various points of duration and degrees of development, with its ever-increasing multitude of events. Then *A* is the cause of *B B*, *B B* the cause of *C C*, *C C* the cause of *D D*, and so on until the present state of things was evolved. The First Cause, *A*, is the most *complex* of all the causes in this chain, for it enfolds all the others, and they are dependent upon it for existence. *B B*, which is the *effect* of *A* and the *cause* of *C C*, is less complex than *A*, and more complex than *C C*; and when we reach *F F*, the whole chain is evolved and simplified. Now, the difference between the doctrince of Evolution and the doctrine of Involution, held by Mr. Spencer and those who think with him, is just this: They hold that *A* is simpler than *B B*, and that *B B* is simpler than *C C*, and so on down the chain. They postulate an ever-increasing involvement, or complication of things, but their Causative Power diminishes as they recede from final effects and approach the Primal Cause. They recognize the existence of the tree of nature, with all its great and wide-spreading branches, but they deny it the soil from which it derives the nourishment which insures its growth and perpetuation.



It is obvious that Mr. Spencer's position is absurd on the hypothesis of a Primal Cause distinct from the Universe. By the

second hypothesis, which asserts that the Universe is itself the Uncaused Being, the absurdity of his position is rendered, if possible, still more glaring. For the line *F F*, with its atoms and forces having *always* existed, it becomes obvious that it cannot have varied either in simplicity or complexity, but has remained always the same. Neither progress nor retrogression can be postulated of an uncaused thing.

Such are the monstrous errors of that system of philosophy which teaches that it is impossible for the mind to arrive at a knowledge of the existence of a Supreme Uncaused Being, who is not the Universe, but the author of it.

Blinded, indeed, must be the eye that fails to see that, as we recede from Primal Cause, in the study of nature, things become simpler and more easily comprehended; but, as we approach Primal Cause, they become more and more complex, until we arrive at the Infinite Complexity of the Infinite God. And this enables us to appreciate that statement of Aristotle, at the very commencement of his "Physics," where he tells us that the natural path for the mind to pursue in the study of Nature is "from things more known and manifest to us," (things furthest removed from primal cause,) "to things that are more known and manifest to nature," (things that are nearer to primal cause.)

And this is the process known by the name of Experimental or Inductive philosophy; for it proceeds from the simple effect to the more complicated cause, and the mind is thus led by progressive steps from the known to that which is hidden. The Agnostic, making a fallacious use of this great truth, which obtains in the study of natural phenomena, takes the stand that, inasmuch as it is impossible to attain to an exhaustive knowledge of natural processes, or, in other words, to master the whole chain of effect and cause from *F F* up to *A*, it is, therefore, absurd and unphilosophical to make this First Cause an object of contemplation, for its *real* nature is forever hidden from us.

According to this teaching, we must analyze exhaustively the whole Universe—we must literally become gods—ere we need trouble our heads even as to the existence, much less the nature, of this First Cause. Mr. Huxley has well expressed this sentiment in his "Physical Basis of Life," when he says: "If a man asks me what the politics of the inhabitants of the moon are, and I re-

ply that I do not know; that neither I, nor any one else, have any means of knowing; and that, under these circumstances, I decline to *trouble* myself about the subject at all, I do not think he has any right to call me a sceptic." A little further on, he makes this sentiment still more emphatic: "Permit me to *enforce* this most wise advice: Why trouble ourselves about matters of which, however important they may be, we do know nothing, and can know nothing." Such is the stand taken by these thinkers in relation to the First Cause of all things.

Whilst it is undeniably true that it is impossible for the human mind to grasp the Infinite, and comprehend in all its entirety the great First Cause, yet there is a method of approaching this great question which enables us to arch across the dead matter of the Universe, and bring ourselves in direct relation with the First Cause. The telescope, the microscope, the crucible, and the scalpel are here of no avail, and we are compelled to rely upon that thinking something within us which we call intelligence.

When we contemplate ourselves as belonging to that chain of cause and effect to which the other phenomena of the Universe belong, (and to this every Atheist is compelled to give his assent,) we are justified in concluding that we are, as far as the globe is concerned, the most exalted aggregation of atoms that the Evolving process, set on foot by the First Cause, has brought forth.

Now, according to the doctrine of Efficient Causes, the First Cause could not produce anything Superior to, or Higher in the scale of Being, than itself. This, of course, is a necessary conclusion if we postulate a First Cause at all. It necessarily follows from this, that Man is Inferior to this First Cause to which he owes his existence. The human mind, then, when it allows itself to contemplate the First Cause, must regard it as something superior, and this superiority is absolute, embracing every conceivable conception of the word.

Now, what is the natural attitude of the mind when it contemplates extraordinary superiority in a kindred mind? Do we not regard such superiority with respect and consideration, which increase in proportion to the worth of the object? Now, inasmuch as this First Cause is infinitely our superior in every conceivable way, we are bound by the laws of reason to contemplate it with all the respect and consideration of which our nature is capable. When

these feelings are carried to the limits of our powers they are denominated *reverence* and *worship*. Hence, the natural outcome of an acknowledgment that the First Cause is, in every way, infinitely superior to ourself, is a drawing forth of all those feelings which constitute worship. When the mind has once firmly planted itself upon this eternal rock, it may be truly held that it has attained to a knowledge of the First Great Cause. One of the broad distinctions between the Atheist and the Theist lies in this all-important mental attitude toward the First Cause. In the mind of the Atheist, the First Cause is regarded of so little importance that, according to Mr. Huxley, "it is waste of time to trouble our heads about it." Such a mind fails to *realize* the infinite superiority of the Cause which brought it into existence, or it would not withhold those feelings which are the legitimate offspring of such a realization. But in the mind of the Theist, the First Cause is an object of reverential contemplation, and is regarded as infinitely transcending even the most exalted conception of which the human mind is capable. Mr. Spencer is constantly criticising the conception of this First Cause, as held by the noblest minds of the day. A long Greek word, anthropomorphism, (*anthropos*, man, and *morphe*, form,) has been used in a spirit of detraction to designate the current conception of the Supreme Cause. But what would these gentlemen have? We are not gods, that we can have a god-like conception of this Great Being! But are we justified in making no attempt simply because our limited faculties are unable to do the theme justice? Must we grovel because we cannot reach the sun? The wings of the eagle were given it to soar, not to crawl! Now, I hold that the human mind is so constituted by its Great Artificer that, when any idea is presented to it, some conception must rise in the mind regarding it. When, therefore, the notion of causation is presented to us, the conception of power to produce or to bring forth something at once springs up in the mind: and our appreciation of this Cause is proportionate to our conception of its power to produce. When we postulate a First Cause of the Universe, the mind recoils upon itself, confounded at the magnitude of the power which this asserts, and reason tells us that, however elevated our conception may be, it will fall infinitely short of the Great Reality. Now, in forming this conception, we have choice of one of two guides: we must either interrogate *what we call our*

higher nature, or we must *sink to what we call our lower nature*; our conception will either be higher than ourselves, or it will be lower. Now, by universal consent, the thinking faculty within us, and which we denominate intelligence, (whether that intelligence be merely the result of a peculiar aggregation of atoms, as held by the Materialist; or whether it is spiritual, that is, *without body*,) is the noblest part about us. Through its assistance, we have arrived at the conclusion that man is higher in the scale of being than the brutes of the field, higher than the birds of the air, higher than any *aggregation* of atoms whatsoever. Old Mother Earth is spurned by her latest ungrateful offspring, who regards her as nothing more than a clod of earth, on a large scale, rolling around another and larger lump of the same material on fire. The eye and the telescope reveal to us countless thousands of these flaming masses whirling through the depths of space. Yet the little "two-legged creature, without feathers," called man, stands unabashed before all this pomp and grandeur, and, looking in upon himself, says, with the utmost complacency: "I am their superior;" and he seems to make good his boast, for he weighs them in balances, predicts their comings and goings, and discovers the invisible threads which bind them one to the other. The speed of the agile messenger, light, he has measured, and the penetrating power of his eye he has so multiplied that he can see a star from which it takes light thousands of years to come. Such are some of the exploits of this *peculiar* aggregation of atoms, called man, in the domain of the vast. His performances in the little world are no less wonderful.

Taking all these great powers into consideration, man is certainly justified in regarding himself the most exalted aggregation of atoms of which he knows anything, from his own experience. But he *knows* (that is, if he recognizes no *other Substance* but atoms) that there *must* be an *aggregation of atoms* somewhere in the Universe infinitely his Superior—that there must be an aggregation of atoms which possesses *Something Higher* than what he *calls Intelligence*. It must also possess Something Higher and Nobler than what he *Calls his Moral faculties*. These are necessary conclusions from the postulate that the aggregation of atoms called the First Cause is absolutely his Superior in every conceivable way. The *consciousness* of *Self-existence*, which man regards among the noblest of

his attributes, he must ascribe, also, to the First Cause aggregation of atoms, or, if not exactly what *he calls consciousness*, *Something* vastly *Higher* than this.

Such a conception as this would be properly termed a materialistic one of the Ultimate nature of the First Cause; but it would not necessarily be a Pantheistic conception, that is to say, it would not necessarily carry with it the idea that all the atoms in the Universe were concerned in the formation of this First Cause. The weakness of such a conception as this could be demonstrated by a child. It postulates uncaused existence, but it limits the First Cause in Body, and, therefore, in power; it makes It act as a whole, but it affirms that It is divisible into parts, being composed of individual atoms. The conception is a gross absurdity, and involves flat contradictions. We must, therefore, in framing a materialistic conception, put no limit to the number of atoms which compose the First Cause. But if we put no limit to the number of atoms which go to make up the First Cause, it is evident that It must embrace all the atoms in the Universe; and we ourselves, the food we eat, the water we drink, the earth we tread upon, and all the stars of heaven, enter into the composition of this Being.

This conception is, if possible, more absurd than the first. The whole material universe being *identified* with the First Cause, this would *destroy* the First Cause *as* a Cause, unless we accepted the absurdity *that a thing can cause itself.* The conclusion, therefore, *annihilates* the postulate with which we started—that of a First Cause. Moreover, although we make It embrace *all* the atoms in the Universe, yet we limit Its magnitude, for the number of bodies occupying space *cannot* be Absolutely Infinite. If they were, there would be no *void Space* in the whole Universe, and it would be SOLID throughout. No motion could exist, for there would be no room for the atoms to move in.

The validity of this latter argument against the Materiality of the Supreme Being, advanced by Aristotle to refute the Materialists of his time, receives fresh support from the researches of Modern Science.

We *know* (if we know anything) that a cubic foot, say of iron, contains a *greater mass* or quantity of matter, (and, therefore, a great number of atoms, if we assume their sameness,) than a cubic foot of water or air; we *know* that a cubic foot of space from which

the air has been removed, contains a less number of atoms than the original space before the removal of the air. If we do not *know these things*, then we know nothing, *and science is impossible.* It becomes obvious, therefore, that there *are not* as many atoms in Existence as there MIGHT be. But if we can conceive that there might be a greater number of atoms than there are, then the mass of matter, or number of atoms, in the Universe does not fill our definition of the absolutely Infinite, for it is *not* of such a magnitude that we cannot conceive a greater. In a word, were the Supreme Being composed of what *we call matter, no* VOID *Space could exist*, nor, indeed, could such things as atoms exist; and what we now call Infinite Space would be an Infinite Absolute Solid, a solid of such a nature as we now conceive the atom to be.

Furthermore, the postulate of uncaused existence absolutely excludes the idea of any change taking place in Its own nature; complete perfection from all Eternity is a necessary inference from such an assumption. Nor would it be possible for this First Cause to worship itself, which it would be doing through the Medium of those parts of its make-up called human beings. No conception of the First Cause could be more absurd than this; and it is unworthy of further thought. It is evident, therefore, that the Great First Cause cannot be in its ultimate nature what *we call matter;* but if it is not matter, It must be SOMETHING else. Now, *that which* is not what we call matter is denominated Immaterial, or SPIRIT; but this comprehensive word may embrace more than one kind of Substance; it, therefore, throws no light on the ultimate nature of the First Cause, except to tell us that It is not BODY, for body *occupies space*, and such a substance is what we call matter. And thus, by a process of exclusion, we arrive at the conception of *Something* which is not matter, and we embrace this something which is not matter under the the general term Spirit, and when we call the First Cause of things a Spirit, we simply affirm that it is not what we call matter. We found this substance we call matter inadequate to embody a sufficiently exalted conception of the First Cause, for it Conditioned the Unconditioned—it Limited the Infinite. We are, therefore, not only justified, but we are compelled by all the laws of thought to designate the Great First Cause a Spirit, always keeping in mind that this word only defines what It is Not, not what it IS. It is also evident that the

substance we call matter cannot in any way enter into the ultimate nature of the First Cause. for this would be making the Infinite depend upon the Finite for Existence. We are thus forced to the conclusion that matter has no place in the essence of the Great First Cause; being free from all admixture with what we call matter, It receives the designation of Pure Spirit. This Pure Spirit, the Cause of all things that exist, being the author of our being, and Infinitely Superior to us, commands the most exalted veneration and reverence of which our limited nature is capable. Now, there can be no contemplation if there is no conception of the object contemplated. It is, therefore, an absolute necessity for the mind, in order to contemplate the First Cause, that it should form some conception of its nature. In forming this necessary conception, it is plainly the duty of the mind to draw it from the most exalted source of which it knows anything.

Now, there is something in man called Intelligence, and, according to his estimate, this is the highest part about him, and, as he reckons himself the most exalted thing on the Earth, this principle must be the noblest thing he is acquainted with. In ascribing this Intelligence to the Great First Cause, he is doing all in his power; if he could conceive of anything *higher* than Intelligence, he would be in duty bound to confer it upon this First Cause. Again, we use a word Good in our vocabulary, and when we wish to describe a man as particularly noble and worthy of veneration, we term him a Good Man. In applying this word to the First Cause, we are simply describing it by the most exalted word our vocabulary furnishes. The word, as applied to man's actions, always implies the *possibility* of its correlative *Evil;* but when used to characterize the Supreme Being, it is *shorn* of its *opposite* and termed Infinite or absolute good. If we had a grander word, which *possessed no shadow*, we would be in duty bound to use it in referring to the First Cause. Again, we have a word Wise, which we apply to acts particularly adapted to meet pre-conceived ends. We, therefore, make use of this word, as the most expressive we possess, to show our appreciation of the act, acts, or process by which the Universe was brought into existence. This word, as applied to man's acts, implies its correlative Folly; but, as was done with the word Good, this opposite is purged away

when the word is used to describe the acts of the Supreme One, and we speak of such acts as being Infinitely or absolutely wise.

And thus we arrive at the *apprehension* (not comprehension) of the existence of an Infinitely Good, an Infinitely Wise, and an Infinitely Intelligent Spiritual (*i. e.*, non-material) Being. Whilst Mr. Spencer strenuously opposes the ascription of any attributes to the First Cause, and charges Sir W. Hamilton and Mr. Mansel with inconsistency for so doing, yet he does the same thing himself when he speaks of the First Cause as a Force or Power. What is there about this word Force which elevates it above all others as a cognomen of the First Cause of things? Like the others, it possesses a correlative which the word Impotence expresses; but, unlike the others, it is a word which is not consecrated by its usage, for it is applied to the most trivial manifestations of the material world. I cannot lift my hand without exercising what is known as Force. The animal walks, the bird flies, the fish swims by Force. There is nothing in the word itself which calls up notions of the highest excellence. On the contrary, it is inseparably associated with the most commonplace events of everyday life. Furthermore, this word Force, our conceptions of which are drawn from what we see in nature, calls up in the mind the idea of an inexorable power *working through necessity*, not a spontaneous and FREE agent unfettered by all limitations. This consideration would of itself unfit the word as a cognomen of the Great First Cause. Why, then, should Mr. Spencer select this word as the distinguishing title of the First Cause instead of the word GOD which man has *coined* from the noblest word which language possesses, and which worship has set apart and consecrated? Throughout the length and breadth of his philosophy, this word, which concentrates within itself the most exalted conceptions of the human mind, receives not a sign of recognition from this wise man of the nineteenth century. We hear much of *Universal Forces*, *Persistent Forces*, *Ultimate Powers*, *Unknowables*. Mr. Spencer insists on taking his *symbols* from his Lower nature rather than from his Higher. This, to say the least, is inconsistent; still this is nothing unusual with Mr. Spencer. Consistently he cannot recognize a First Cause at all, for he identifies his Ultimate Power with the Universe; the Universe would thus become a First Cause, which is absurd.

This subject will be treated more at length in a future chapter.

Having explained what we are to understand by the process of Evolution, we will now consider the rival claims of *Immediate* (Instantaneous) Creation, or Creation without the intervention of Secondary laws; and Creation by Evolution, or Creation through the medium of Secondary laws.

Let us first study the ground upon which their claims are equal—

Scriptural authority for the one is the *same* as for the other. The first chapter of Genesis simply *asserts* the fact of Creation, it does not attempt to explain the *method* by which Creation was accomplished. In a word, we are not to look upon the first chapter of Genesis as an effort to give a scientific exposition of the Universe, but we must view it purely as a revelation, impressed by a series of reiterated assertions, in order to fill the mind more completely with the one sublime fact that, in the beginning, God did create all things.

Prejudices once rooted in the mind are hard to overthrow, and the persistence with which intelligent and cultured men have insisted on a *literal* interpretation of the first chapter of Genesis will always remain a striking illustration of the fact.

It must be borne in mind that Genesis was written at a time when even the most civilized part of the world was steeped in ignorance and barbarism, and the little knowledge that did exist was entirely confined to the priesthood. The masses of the people, both high and low, were just emerging from a savage condition, and their intellectual state was too weak to grasp anything but the simplest facts and the barest statements.

Granting, then, that Moses, or whoever the author was, did appreciate the full significance of what he wrote, he certainly would not have attempted anything more than to open the eyes of the people to the existence of one Supreme Being, the Creator and Sustainer of all things.

Had he attempted a scientific exposition of the methods by which God brought into being His Creation, he would only have confused their Savage minds, and obscured what he most wished to impress.

Imagine Moses giving lectures on Evolution to the Children of Israel in the wilderness! Whilst we are not to regard, then, the first chapter of Genesis as a scientific exposition, it is interesting

to note, however, that a few changes of words, (words that bear another interpretation in the Hebrew,) will give us a picture such as the most advanced of scientific thinkers have painted for us. Later on a running commentary of the first chapter of Genesis will be given, with the changes above referred to, and the reader may judge for himself.

It is not surprising that the notion of *Direct* (instantaneous) Creation should have been attached to the acts referred to in Genesis. Indeed, ignorance that God *could* have employed any other method than that of modeling directly, as the artist forms his image, is a sufficient explanation why the conception of Evolution has been so long making its way.

Belief in Evolution presupposes no slight knowledge of nature and the laws which govern her processes. Absence of the requisite scientific training will doom many minds, even in this enlightened age, to remain a blank as to the methods by which the Supreme called into being His Creation. Such minds, *if they form any conception at all of Creation*, can only conceive of the Creator as molding the plastic clay and forming each member separately and distinctly. Or, they may conceive of all animated Creation suddenly springing from the bosom of the Earth, as Milton pictures to us in the grandest poetical composition that the human mind has produced.

> "The grassy clods now calved; now half appeared
> The tawny lion, pawing to get free
> His hinder parts, then springs, as broke from bonds,
> And rampant shakes his brinded mane; the ounce,
> The libbard, and the tiger, as the mole
> Rising, the crumbled Earth above them threw
> In hillocks; the swift stag from under ground
> Bore up his branching head; scarce from his mold
> Behemoth, biggest born of Earth, upheaved
> His vastness; * * * * "

This conception, which Genesis no more warrants than any other method of Creation, was the only one Milton could entertain, if he thought upon the subject at all. His scientific knowledge was not sufficient to enable him to form a Grander Conception than this. Now, we must select that method as true which most redounds to the glory of the Supreme Being; and this is our *bounden duty.* The conception of Creation, under any circumstances, fills our

minds with the grandeur and power of God; but Creation by Evolution gives us a far grander conception than that of *direct* creation. This argument, alone, should determine our selection between the two; but, in addition to this all-sufficient reason, there are other arguments, drawn from the great book of nature, that should set at rest all doubts upon the subject.

We will, then, arrange the arguments in favor of Creation by Evolution under three heads, and, for easy comparison, place in a parallel column the facts in relation to Instantaneous Creation.

Creation by Evolution.	*Direct or Instantaneous Creation.*
I. It is not antagonistic to anything contained in Scripture.	I. There is nothing in Scripture which favors it above the other.
II. It carries with it a grander conception of the wisdom, power, and goodness of the Supreme Being.	II. It tacitly *limits* the power of the Creator, and, therefore, does not elevate our minds as does the other.
III. There is positive scientific evidence, which appeals to many with the force of a mathematical demonstration.	III. Not only is there no scientific evidence in its favor, but it is *absolutely at variance* with the writing in the great book of nature.
IV. It recognizes that the chain of secondary causes set on foot by Omnipotence can never be exhausted by a created Intelligence. *It, therefore, holds out to the soul the promise of a never-ending development.*	IV. In assuming that the world is a direct act of creation, it affirms that a barrier has been set to our progress, and that we will ultimately reach the bounds of the attainable.

The first of these propositions having already been examined, we will proceed to the second. That the doctrine that God created the world and all things else through the agency of law carries with it a grander conception of His power and wisdom will not be denied when the subject is examined. The mechanician who could make a machine that could itself make another would justly demand a greater degree of admiration for his skill than he who

had merely manufactured a simple machine. In the first instance, the author must not only take into account the perfect working of the first contrivance as a simple machine, but he must so construct its complicated parts that it will, of its own working, produce another apparatus.

Let us suppose the case of three men: A makes a very complicated machine for some particular purpose and is much praised for his ingenuity and skill. B comes along, and, to outdo A, makes an apparatus that will make A's machine without any interference on his part. If we admired A's achievement and wondered at his skill, what shall we say of B's wonderful work? Another man, C, hearing of this wondrous machine, proceeds to invent an apparatus which will make A's machine, which, in its turn, will make B's machine, and this still another, without any interference from him. How shall we compare this last man's skill with that of the other two? Can there be a question as to which of these three men was the most skillful? Now, the Evolutionist believes in a God who is sufficiently powerful to make laws that will make laws, and these, others, and so on, until the whole Universe is evolved.

No reasonable man will deny that C is as much the author of the last machine as of the first; so, no just thinker will deny that God made the Universe.

We may take C's series of machines as a good illustration of the great truth which has been so much insisted upon in the foregoing pages, namely, that cause must be more complicated than effect. The first machine evidently contained within itself the causative power which produced all the others. In the process by which the final machine came into being, the evolution of the first machine is completed, and all the powers stored up in it by the author are unfolded in this final effect.

The theory of Evolution so expounded is beautiful to contemplate. It elevates our conception of Almighty Power, and it is in accord with all that we know of the workings of His laws.

From a minute speck of protoplasm, called an egg, is evolved man, whose intellect has subdued nature, and made her subservient to his wishes. In that minute mass of albumen, man existed *potentially*, but it required the fostering care of the Creator's laws to guide the embryo in its progress towards development. Keeping

the Creator's Omnific Hand always before his mental vision, the Evolutionist sees no difficulty, nor has any repugnance, in descending to the brutes to seek his immediate progenitors. Nor need he stop here; but, passing on down the scale of Being, he may cross the apparently broad gulf which separates the living from the non-living, and recognize in the atoms of the "Cosmical Vapor" his remote ancestors. But he does not stop here; having reached this lowest conceivable point, he ascends until, kneeling at the throne of the Living God, he beholds the ineffable source from which he sprang. There is nothing in this philosophy to shock the sensibilities of the most Orthodox Christian, and religious scruples should not stand in the way of its adoption if the individual can see in it a sufficient scientific warrant.

CHAPTER III.

ASTROGENESIS,* OR THE EVOLUTION OF WORLDS.

"The heavens declare the glory of God and the firmament showeth his handiwork."

"In the beginning," the Universe "was without form and void, and the Spirit of God moved upon the face of the deep." In obedience to the fiat of Omnipotence, the atoms sprang into existence. He appoints to each its mission, and impresses upon it the seal of His Almighty Will. The atomic host, obeying the law of Universal gravitation which the Supreme had set upon them, to a center rush, and, such the force of impact, that intense heat and light are generated.

This heavenly warfare is carried on throughout the illimitable expanse, and each grand center of attraction is destined to bring forth a Stellar Universe. And now the rythmic pulsations of the "music of the Spheres" break in upon the silence of the infinite void, and from each revolving orb an anthem of praise ascends to Him whose power brought it into being.

These Stellar or Astral systems, dotting the boundless ocean of space, may be likened to the archipelagoes which diversify the waters of the globe. A number of these Astral sytems may unite to form another and grander system, which we will call a Polyastral system; and a number of Polyastral systems may unite to form a still grander system. And so on, wheel within wheel, until the imagination, overpowered by the contemplation, sinks back confounded.

A survey of the heavens on a cloudless night will reveal to the naked eye of ordinary power several thousand stars scattered broadcast over the vault above. It will also observe a whitish band spanning the heavens, separating into two at one point. This luminous appearance is the Milky Way, the astral system to which our Sun and all the stars visible to the naked eye be-

* GR. ASTRON, a star; and GENESIS, production or generation.

long. We are indebted to the great Herschel for this discovery. After years of observation and study, he arrived at the conclusion that the astral system to which we belong is in shape like an irregular disk deeply cleft on one side. In order to form a clear idea of the shape of our star system and of our own position in it, let *Fig.* 1 represent a *vertical* section of this disk. When viewed

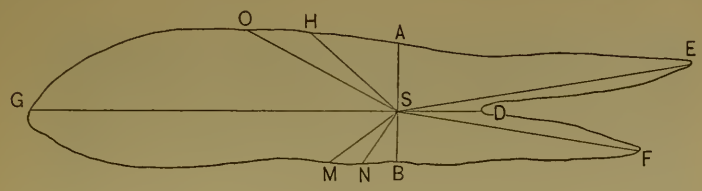


Fig. 1

from above, it would present a *circular* appearance, whilst from the side it would present the appearance depicted in the diagram. The Sun, *S*, is situated in the substance of the disk or lens, and near to the point *D*, which represents the spot at which the milky way separates into two bands.

Now, when we survey the heavens on a clear night, and direct our gaze to any part of the vault except along the track of the milky way, we are viewing this disk of stars along its *shortest* diameters, that is, along the lines *SA*, *SB*, *SD*, *SH*, *SO*, *SN*, *SM*, and all lines which do not correspond to the great diameters of the lens. When thus viewed, the range of stars seen is a very brief one; hence there is no nebulous appearance. But, if we permit the eye to follow the milky way, we view this disk of stars along its *greatest* diameters, that is, along the lines *SG*, *SE*, *SF*, and along lines lying in the same plane with these but perpendicular to the paper; the mass of stars through which we now look is so great, and their distance so tremendous, that a nebulous appearance is the result. The general reader, in attempting to form a true conception of the shape of our star cluster, will find his imagination materially assisted by thinking of a flattened turnip, or a watch, with a deep *horizontal* notch on one side. A *vertical* section of such a turnip will present the appearance in the Fig. He will thus easily realize the fact that in looking along diameters corresponding with the lines *SG*, *SE*, *SF*, he will see a greater mass of stars than by looking along any other diameters. He will also

fully appreciate the fact that such an appearance as the milky way is to be expected from the shape of the cluster and our position in it.

The constellations are wedges cut out of this turnip. For example, the Great Bear lies between the lines *SO* and *SH*, and, consequently, it contains but few very small stars. Constellations along the lines *SA*, *SB*, *SD*, would contain still fewer very small stars; but constellations along the great diameters, or, in other words, along the track of the milky way, are enriched by a brilliant back-ground of star dust.

But Herschel's ambitious mind was not content with discovering the shape of the star cluster of the milky way; he also attempted to number the individual suns composing it. After a long series of observations, he arrived at the conclusion that there could not be less than eighteen millions, and that there were probably more than twenty millions of stars in the system to which we belong. Each one of these stars is a sun; many of them far exceeding our own in grandeur, and carrying along a retinue of planets far exceeding in number, it may be, those which revolve around our own Sun.

To form some conception of the magnitude of the distances which separate our own Sun from other Suns in the nebula of the milky way, let us take the speed of light in a second of time as our measuring rod. Light will travel nearly eight times around the Earth in a single beat of the pendulum. Now, it requires this agile messenger not less, and probably much more, than three years to come from the nearest star (Alpha Centaur) to us. The ray of light which left the Pole Star thirty years ago, Earthward bound, has not yet arrived, and will probably require some years longer before it reaches its destination. Such are the magnitudes of these distances that astronomers, for a long time, were unable to compute them even approximately. Improved instruments have enabled them to make rude calculations, and the results so obtained are always rather under than above the true distance. It has been estimated that it requires thousands of years for a ray of light to cross the greatest diameter of our Astral System. Well may the mind stagger at such revelations. But as immense as it is, our Star Cluster is but a point in the Vast Universe. Buried in the depths of space, at distances that it requires light millions of years to span, are thousands on thousands of other astral systems as large,

or larger, than our own. Over 5,000 of these nebulæ have been tabulated, and as the powers of the telescope are increased, new ones come into view. Many of these have been resolved into stars, but there are others which are still in a gaseous state. These flaming masses of matter, whirling around in the abysses of space, demonstrate to us, beyond a reasonable doubt, the truth of the Evolution of worlds from a nebulous mass.

(Fig. 2. Spiral Nebula in the Virgin.)

Fig. 2 represents one of these revolving masses of cosmical vapor.* Here we have the process of world formation going on before our very eyes.

Our own astral system may unite with other systems, which the telescope has revealed to form a Polyastral system, and this Poly-

* Whilst it is possible that the theory of the mechanism of world formation, as now understood, may undergo modification with advancing knowledge, yet the main feature of the nebular hypothesis, viz: that all matter was once in a nebulous condition, will never be refuted.

astral system is probably a unit in another and still grander system, and this in still another; and so on until the imagination succumbs, overpowered by the picture which its own daring has created.

Reasoning from analogy, there is every reason to believe that the whole Material Universe is revolving as a *whole* around some grand center; and this point of space, it is rational to conclude, enjoys in a peculiar manner the manifestation of the Divine Power. From the Deity, as a center, all things radiate; to the Deity must all things converge. Well may the mind ask if there is any limit to the Material Universe. Yes, as vast as it is, there must be a limit; the Universe is a creature, and cannot equal its Creator; God alone is infinite.

The gaseous nature of many of these nebulæ has been demonstrated by Dr. Draper and others, through the agency of the spectroscope. In them we have ocular demonstration of the great truth of world evolution, first suggested by the Greeks, and in modern times elaborated by Kant and Laplace.

This theory is substantially as follows: The matter of which the Material Universe is composed was once equally diffused throughout space. Under the influence of the Universal law of the attraction of gravitation, various centers of attraction would be developed. Now, it is a well-known physical law that fluids rushing to a center cause a rotary movement in the whole mass. Intense heat would also be generated by the Universal friction resulting. Revolution on an axis would bring into play centrifugal and centripetal forces. Under the influence of the tangential or centrifugal force, there would be a constant flow of matter toward the equator of the revolving mass. Eventually, the centrifugal force would become so great at this point, owing to the increased rapidity of the rotary motion, that the centripetal force, or the attraction of gravity, would be no longer able to counteract it; the result would be that an equatorial ring, somewhat denser than the central mass, owing to the radiation of its heat, would be detached, and the size of the ring would be in proportion to the fluidity of the central body and the rapidity of its revolution. The parent body, undergoing further condensation, would gradually leave the ring behind. Eventually, this ring would rupture, and, coalescing into one globular mass, become a satellite revolving around the central body. This process would be repeated until the density of the

central mass had become so much increased, and its rotary motion so much diminished, as to enable the attraction of gravity to successfully antagonize the centrifugal force.

Tennyson has beautifully embodied the theory in the following magnificent lines:

> "This world was once a fluid haze of light,
> Till toward the center set the starry tides,
> And eddied into suns, that wheeling cast
> The planets."

According to the theory, therefore, our Sun once filled the entire space now occupied by the Solar System, and the planets were successively thrown from its surface. First Neptune, then Uranus, Saturn, Jupiter, the Asteroids, one after another in quick succession, then Mars, the Earth, Venus, and, lastly, Mercury. It is possible that another planet exists between Mercury and the Sun, but its existence rests on insufficient evidence. The Satellites of the various planets were thrown off from their surfaces in the same way that they themselves were thrown from the Sun. The rings of Saturn seem to furnish corroborative testimony of the truth of the nebular hypothesis, for by it their existence receives a rational explanation. Besides the rings, Saturn is accompanied by a large family of moons. Why the last rings thrown off failed to coalesce into moons, is not easy to conjecture. However, it has been demonstrated that these rings are not solid, as was at one time supposed, but consist of small fragments revolving around the planet. In other words, they are bands of meteors circling around the parent mass. There are a number of facts common to all the planets which receive a rational interpretation on the supposition that the nebular hypothesis is true.

1. They all revolve in orbits, the planes of which pass through the centre of the sun. These planes are not exactly coincident, but their divergence is not great.

2. They all revolve around the sun, in the same direction that it revolves on its own axis.

3. They all revolve on their own axes in the same direction that the sun does on his, and their satellites obey the same law.

The three laws of Kepler show the close relation subsisting among the planets. Kepler, by the light of these, was led to believe that there existed a planet between the orbits of Mars and

Jupiter, but he did not live to see it demonstrated. In 1772, the Astronomer Bode declared that the conjecture of Kepler would be found to be an actual fact, and enunciated the law which bears his name, by means of which the Asteroids were afterwards discovered.

This law is as follows:

Supposing 4 to represent the distance of Mercury from the Sun, the distances of the other planets are obtained by adding to this number a geometrical series, of which 3 is the first term, increasing by the ratio 2.

This may be formulated thus: If we add the No. 4 to each of the following, 0, 3, 6, 12, 24, 48, 96, 192, 384, the resulting numbers, 4, 7, 10, 16, 28, 52, 100, 196, 388, will represent very closely the relative distances of the planets from the Sun.

From this law Bode predicted that a planet would be discovered between Mars and Jupiter, corresponding to the number 28. But the actual discovery was not made until after his death by Piazzi, Oberling, and Harding, who determined the existence of the first four Asteroids in the place that Bode predicted a planet would be found.

The law holds pretty well for all the planets except Neptune. By comparing the distances called for by Bode's law, and the distances determined by observation, this can be appreciated.

	Mercury.	Venus.	Earth.	Mars.	Asteroids.	Jupiter.	Saturn.	Uranus.	Neptune.
By Bode's law, .	4	7	10	16	28	52	100	196	388
By observation,	3.87	7.23	10	15.23	26.25	52.3	95.39	191.82	300

It will be observed that the only great discrepancy exists in the case of Neptune.

Sufficient evidence has been adduced to demonstrate beyond a reasonable doubt that the nebular hypothesis is the true explanation of the manner in which the solar system, and, probably, the whole material Universe, came into being.

We have seen how the Earth was thrown from the Sun in a molten state, and how the moon, in its turn, was developed from the Earth.

By the continued condensation and shrinkage of the molten

mass, the present dimensions of the Earth were reached. Its figure, which is a sphere, bulging at the Equator, and slightly flattened at the poles, is what we would naturally expect from the action of centrifugal force acting upon a plastic mass. The great chemical activity going on at this period of the Earth's history resulted in the combination of Oxygen and Hydrogen in proportions to form water. At first this existed as vapor, which surrounded the Earth with an envelope of great thickness. As the surface gradually cooled, a temperature was at last reached below the point necessary to keep the water suspended as aqueous vapor. Condensation then began, and this was followed by its precipitation upon the face of the Earth as rain. The surface of the planet soon became enveloped in one continuous ocean, and then followed a series of upheavals and subsidences, caused either by the shrinkage of the central molten mass, and consequent wrinkling up of the Earth's crust, or by internal convulsions, or by both. Later on, life, both vegetable and animal, began to make its appearance in the waters, and soon the unlimited expanse of ocean teemed with organic beings. In course of time, the points of land upheaved by internal convulsions, or by the natural process of shrinkage, remained above the waters a sufficient length of time to allow of the development of land life, both vegetable and animal. The main mountain chains and plateaus, and the beds of the oceans now existing, were more the result of the shrinking process than of internal convulsions, though volcanic action must have existed on a scale of which we cannot form the most remote conception.

Such, then, is the history of our planet from the time that it existed as a nebulous mass of incandescent matter floating through space until it was evolved into a world fit for the abode of organic life.

Having produced some of the evidence upon which is based the doctrine of Evolution in its relation to the formation of worlds, it remains to show that this same process of Evolution has brought about existing vegetable and animal life. We will first consider the evidence, and, later on, endeavor to show the probable manner in which this development took place.

CHAPTER IV.

ARGUMENTS FOR THE DOCTRINE OF EVOLUTION DRAWN FROM THE FIELD OF LIVING NATURE.

In the preceding chapter, we considered the evidence for the doctrine of Evolution drawn from the study of the constitution of the solar system and the configuration of our own globe. We will now marshal the arguments drawn from the field of organic nature, and which lie scattered around us on every hand.

SECTION I.

Evidence from ONTOGENESIS, *or the Evolution of the Individual Form; the Animal from the Egg, the Plant from the Seed—The Metamorphosis of certain animals—Significance of rudimentary organs.*

In the Evolution of the chick from the egg, and the plant from the seed, we see familiar instances of the Evolutionary process. In the *apparently* simple, but *really complex*, constitution of the fecundated egg we behold a wonder wrought as great as the Evolution of a world from a nebulous mass. The astronomer has traced the various stages of growth in the embryo world, so the biologist has traced the various stages in the embryonic growth of the plant and animal. The astronomer gives certain names to certain forces, whose existence he is compelled to assume in order to explain the various processes of world-development, but the *real* nature of which are unknown to him; so the biologist recognizes the existence of certain forces which govern the development of the albuminous mass of the ovum into the animal, but the real nature of these forces is as much beyond him as the force of gravitation is beyond the astronomer. Under the term "*vital force*" or *principle of vitality*, the biologist embodies a recognition of these obscure forces which govern the processes called vital, but these phrases, which will be examined more carefully in a future chapter, are to be regarded simply as substitutes for more accurate knowledge. We know that there are certain causes which set on foot the peculiar activity in the albuminous mass of the ovum,

which eventually lead to the production of a new being, and, in the absence of more exhaustive knowledge of the *true nature* of these causes, we are justified, and, indeed, necessitated, to embrace them under the name "vital force."*

When we contemplate the wonderful metamorphosis which the egg undergoes under the influence of these vital forces, we should no longer regard the Evolution of animated nature as a matter of astonishment, but, on the contrary, should consider it as something to be looked for.

The Evolutionist simply claims that what we see enacting before us in a few weeks or months in the production of an individual, has been, and is being, enacted in the production of animated nature as a whole. He simply claims that the first germs of life which appeared on the globe were the ova, from which all organic life has been developed. Both processes are essentially similar, the chief difference being the *time* required.

The ovum of the individual human being requires but nine months to pass through the process, but the *ovum* of the Race has required some millions of years. What the environment of the individual egg is to its development, that, the environment of the physical world, through all ages, has been to the egg of animated nature.

It may excite some surprise in the mind of the general reader to learn that the egg of all mammalian animals, including man, are so similar in appearance that they cannot be distinguished from one another. The egg of Oviparous animals, as the Bird, Reptile, and Fish, being destined to develop the new creature outside of the body of the mother, is furnished with a store of nutritive material, consisting of an albuminous envelope, known as the white of the egg, and a central yellow mass, called the nutritive yelk. The fully-developed egg of such animals is therefore much larger than that of the higher animals which give birth to their young. But if the egg of a bird, reptile, or fish be examined before it has acquired these investing envelopes of nutritive material, its similarity to that of the higher animals is at once apparent. If we compare the primitive hen egg, the primitive fish egg, and the primitive human egg, this similarity will be at once appreciated.

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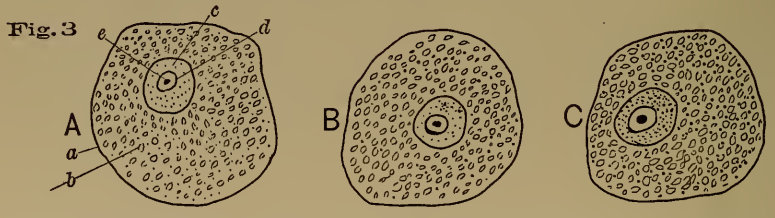
* Mr. Huxley ridicules this phrase, but without reason, for it pretends to nothing more than a recognition of the existence of unknown forces.

In Fig. 3 is represented the primitive egg of a fish, hen, and human being, all very much enlarged. So similar are they in apparent structure that the microscope can detect no difference among them.

The parts that can be distinguished have received the following names:

1. The investing membrane, *a*, (Vitelline Membrane.)
2. The inclosed protoplasm or formative yelk, *b*, (Vitellus.)
3. The nucleus or germinal vesicle, *c*, (Vesicula germanativa.)
4. The germinal spot, *d*, (Macula germinativa.)
5. The germinal point within the germinal spot, but this latter is not always distinguishable.

Now, this description will not only serve for the ovum of a human being, but it will also serve as a picture of the sponge egg as well! Such is the similarity of the primitive egg of all animals whatsoever. The ovum of all creatures is a cell, consisting of a cell wall, cell contents, nucleus, and nucleolus.



A. Primitive egg of a Fish. *B.* Primitive egg of a Hen. *C.* Primitive egg of Man, all very much enlarged—natural size about $\frac{1}{120}$ of an inch.

a. Vitelline, or investing membrane.
b. Vitellus, or inclosed protoplasm.
c. The nucleus, or germinal vesicle.
d. The germinal *spot.*
e. The germinal *point.*

The primitive egg of all animals is an apparently simple cell and capable of changing its shape.

In its *fully* developed condition the ovum of a human being is about one tenth of a line ($\frac{1}{120}$ of an inch) in diameter, and the ovum of all mammalia is about the same size and cannot be distinguished from one another even by the aid of the microscope! This fact should warn us not to place too much importance on *sensible* qualities, and should teach those who say that "the egg is so simple

that it can be described in a line," that the true structure of the egg is so *complex* and *hidden* that even the highest powers of the microscope are of no avail. The egg of an oyster produces an oyster, the egg of the human being produces a human being, their sensible characters are the same. What is the inference? Why, that the *tendencies* or *laws* which enwrap the egg constitute its grand distinguishing features.

This apparent similarity of the ovum exists also in the embryo up to a certain point of development. The first step in the developmental process of the fertilized ovum, whether it be destined to bring forth a man, a fish, or an oyster, are the same. This consists in the breaking up of the yelk substance into cells, which, cohering, form a membrane. This yelk cleavage is common to all animals whatsoever, and something analogous to it takes place in the vegetable world, in the granulating process which the contents of the female vegetable cell undergo after its union with the male cell.

Among many of the lower animals, propagation also takes place asexually by division, and the formation of buds and spores. But even among the lowest of the animal creation, (with, perhaps, the exception of the lowest *moneron*, which is merely a mass of protoplasm without cell structure,*) true sexual propagation may take place by the direct union of a male and female principle. Two of these creatures, which are apparently nothing more than simple cells, have often been observed to come together and coalesce into one; the contents of the amalgamated cell then undergo genuine cleavage into numerous cells, each of which is a new creature similar to its parents. When the cleavage process is complete, the membrane of the parent cell ruptures, and the new creatures escape and commence an independent existence.

Among the higher animals, the formation of germinal layers from the substance of the yelk takes place as follows: The *apparently homogeneous* mass of yelk protoplasm undergoes transformation into cells, and a membrane (*the Blastodermic membrane*) consisting of cells investing what is left of the yelk, is the result.†

* The Male and Female principles were probably not evolved until the primordial *Zooplasm* had reached the cell stage in its upward growth.

† In the bird, reptile, and fish egg only the *formative* yelk, or "*tread*," undergoes this cleavage into cells.

This membrane divides into two, the external (the *Ectoderm*) and internal (the *Endoderm*) blastodermic membranes. Later on a *third* membrane is produced between them called the Mesoderm. The Mesoderm, in its turn, undergoes division into two. At this stage, therefore, the embryo consists of four germinal layers or membranes.

1. The Ectoderm, which is destined to bring forth the skin and its appendages.
2. The External and Internal layers of the Mesoderm, which produces the nervous, muscular, osseous, and vascular systems, and the various viscera.
3. The Endoderm, which produces the lining membrane of the alimentary canal. If the Egg is destined to bring forth a fish, reptile, bird, or mammal, a *groove* makes its appearance in the germinal spot. This groove is gradually deepened as the germinal layers grow up around it, and finally coalesce above it, converting the groove into a canal. In this canal is produced the spinal cord. Whilst this is going on, two lateral plates are growing out on either side, which, meeting below, form the abdominal cavity.

It is not the purpose of the writer to give a description of embryonic development, but simply to point out the parallelism which exists in all embryonic growth up to a certain point, and to draw therefrom the inference that, in the remote past, they might have had their origin in a common type of life. This subject will be again referred to when we come to study the growth of animal life on the globe, and then its true significance will be better appreciated.

What the Egg is to the animal the Seed is to the plant.

The examination of the interior of a wheat grain, or the seed of any vegetable whatsoever, reveals the presence of an embryo plant. The mass of the seed serves the same purpose to the plant germ that the albumen and immense yelk development of a chicken's egg does to it, namely, it supplies the growing plant with food until it is sufficiently mature to strike root into the Earth and draw its nourishment thence. This embryonic plant originally existed as a simple cell (a *plant egg cell*) which, being fertilized by union with a male plant cell, is converted into an embryonic plant, and this process is carried on during the growth and ripening of the seed. When the seed is fully mature, it is thrown from the parent

stem, and, meeting with proper conditions, the germ takes on development, and, in course of time, reproduces its parent.

The conversion of a simple plant cell into a *parent* plant cell, by the union of the male and female principles, is initiated by the transformation of the apparently homogeneous cell contents into a *granular mass*, and this step in the plant cell is in all respects analogous to the yelk cleavage which takes place in the animal cell.

The Evolutionist who is disposed to carry out analogies to their furthest limit may recognize five different kinds of Eggs in the Universe:

1. The Ontogenetic Egg, or the egg which produces the *individual* animal or plant.
2. The Zoogenetic Egg,* or the first germs of animal life, from which the whole animal creation has been developed.
3. The Phytogenetic Egg, or the first germs of vegetable life, from which the whole vegetable creation has been brought forth.
4. The Biogenetic Egg, or the first germs of life in general, being the source from which the two preceding have sprung.
5. The Astrogenetic Egg, or the Material Universe as it existed in the nebular state. The *cleavage* of this uniform nebulous mass into worlds may be likened to the process which we see taking place in the animal and vegetable egg cell. Thus the whole Material Universe may be compared to a huge animal; but what a lifeless carcass it would be were it not for the all-pervading Spirit of Omnipotence:

Having noticed the very familiar process of the Evolution of an animal from the Egg, we will now direct our attention to another familiar example of Evolution, namely, the transformation by Evolution of certain animals from one type of life to another.

Every one knows that a tadpole, if he live long enough, will certainly turn into a frog, and the singular appearance which these creatures present when they are just about to complete the metamorphosis has excited the mirth and wonder of many a juvenile of ten summers. It is only in comparatively recent times that the full significance of that change has been appreciated. In this

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* *Zoön*, an animal; and *Genesis*, production.
Phuton, a plant.
Bios, life.
Astron, a star.

metamorphisis of a *fish* into a *true* reptile, nature reads us a lesson, and teaches us that what may occur in the individual, (*ontogenetically,*) may also occur in the race, (*phylogenetically.*)

I have said that the tadpole is a fish, and so it is, for it is a *gill-breather*, and can only exist in the water. In the course of its Evolution into a frog, the tadpole gradually developes a lung, and, when the transformation is half complete, it presents us with the true Amphibian* type, that is, an animal which possesses both gills and lung, and which can breathe either air or water. As the change progresses, the lungs become more and more developed at the expense of the gills, which grow less and less, and, finally, when the lungs are fully formed, the gills have entirely disappeared, and the tadpole becomes an air-breathing frog.

Simultaneous with the change in the breathing apparatus occur changes in other internal organs. The heart† acquires a third cavity, and the outward form loses the fish-like character, and true limbs are developed—first the fore limbs, then the hind limbs, and, finally, the tail drops off. The animal now hops about on land, a perfect air-breathing frog.

The same transformation occurs in the larva of the newt, (*Triton Cristatus.*) The stages of development are exactly similar—first, the animal is a *fish*, then an *Amphibian*, and, lastly, a *reptile.* In order more fully to appreciate these changes in the life of an individual, it will be well to mention that the true Amphibians now existing are to be regarded as the connecting links between the fish and reptile. Such are the *Lepidosiren Paradoxa*, discovered by Dr. Natterer, in the river Amazon, and the *Lepidosiren annectans*, found in the river Gambia. Also the *mud eel* of South Carolina, (*siren lacertina,*) and the *Axolotl* of Mexico. All these creatures possess both *gills* and *lungs* throughout their whole life. Whilst they are true amphibians by nature, yet it is possible that they might all be deprived of their water life without necessarily

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* From Gr. *Amphi*, double; and *Bios*, life.

The word Amphibian is often used to embrace animals which live in the water, but which breathe air alone, and, in this sense, includes whales, porpoises, &c. But the word should be limited to those animals that have both gills and lungs.

† The development of another cavity in the heart is the result of the development of the lung.

causing death. As an illustration of this, the Axolotl furnishes a good example. A number of these creatures were kept in the Jardin des Plantes at Paris. Several individuals escaped from the water in which they were placed, and when found some time after, they had lost their gills. This caused no little excitement among scientific men, for it demonstrated that a type of life, before considered absolutely permanent, could be changed by altering the external conditions under which it lived. The metamorphosis of the caterpillar into a butterfly is as familiar, or more so, than the examples we have just cited. The butterfly lays its eggs in a favorable situation and the young caterpillars are hatched. During the progress of their growth, they pass through several moulting processes, and finally the caterpillar reaches its full size. The caterpillar is a *true worm*, both in external appearance and internal organization. But this worm is destined to pass into another state of being, in which its old form entirely disappears and a new order of being results. It forms a chrysalis, and either buries itself in the ground or hangs itself upon a branch. Here it lies dormant, as far as outward motion is concerned, for a considerable length of time, but the organic activity going on during this period is marvellous; in this, its pupa state, the organization of the caterpillar, both internal and external, undergoes a complete transformation.

When the change is completed, the perfect insect bursts its encasement and escapes, mounts aloft, making the air brilliant with its delicate tints and rich hues. From the sluggish and unsightly worm that can scarce drag itself along to the airy and beautiful creature which rivals in the richness of its coloring the flowers of the field—what a transition! We can now appreciate the sublime sentiment that led the wise old Greeks to select the butterfly as the symbol of the soul, (Psyche.) The soaring spirit lies entombed in its prison-house of clay, all its beauty disguised or concealed, all its powers dormant; only when it disencumbers itself of material bonds can it attain to its full beauty and soar to those regions where it is destined to expand throughout the long ages of eternity. The metamorphic processes above noted in the life of the frog and the butterfly are common to nearly the entire lower creation. The young animal on leaving the egg presents an entirely different appearance from the parent form, and generally closely resembles a form *just* below it in the scale of being. Thus we have seen that

the larva of the frog resembles and is, to all intents and purposes, a fish; the larva of a butterfly is a worm; the larva of many of the worms cannot be distinguished from the larva of a polyp; the larva of a star-fish resembles closely an infusorial anamalcule, as does, also, the larva of a jelly-fish. These facts are significant of their unity of origin. When the embryonic development of the animal is studied, these relations and correspondencies are carried still further back, even to the very starting-point of all animal development. Later on, we will show that the human embryo in its development passes through states which have their parallel in the types of life existing on the globe. Thus the animal reproduces, in its *individual* development, the conditions through which it passed in its *race* development.

We will now consider the evidence furnished by the existence of *rudimentary* organs in certain animals. Rudimentary organs are those which take no part in the life of the animal; they remain in an undeveloped state and are of not the slightest use in the economy of the individual. Such, for example, are the external muscles of the human ear, the worm-like appendage attached to the commencement of the large intestine, the teeth of whales which never cut the gum, the splint bones attached to the cannon bone of the horse, the eyes of the mole and certain fish.

The existence of these undeveloped organs, according to the doctrine of special creation, could not receive an intelligible explanation. It was said that they were retained for the sole purpose of maintaining the type to which the individual belonged, and other arguments equally unsatisfactory were advanced.

But, by the light of the doctrine of Evolution, all these problems are susceptible of a scientific explanation. These rudimentary organs are nothing more than hereditary transmissions received from remote ancestral forms, in whose life these organs played an important part. Thus the external muscle of the human ear, which are of no use to us whatever, are very essential among the lower animals. The mole has no use for visual organs, for it passes its life in utter darkness, but the mole's ancestors lived above ground, and to them the possession of well-developed eyes was all-important. So the splint bones, which are of not the slightest use to the existing horse, are the relics of the lateral toes of its immediate three-toed ancestor.

Here, then, we have a scientific solution of a difficult problem which at once recommends itself to our reason, and which does not require us to violate the dictates of common sense and call in question the Divine ordinance of the Universe.

We will now pass on to the evidence furnished by the truths of natural selection, and consider its influence in originating the various species of animal and vegetable life, by means of heredity and adaptation to existing conditions, thereby insuring the survival of the fittest.

Section II.

Evidence from Natural Selection, and the Resulting Mutation of Species.

The greatest difficulty the doctrine of Evolution has had to contend against is the rooted conviction that species are immutable, and can undergo no change. According to the Special Creationist, the species are the *units*, created separately, which go to make up the whole of animated nature, both animal and vegetable. These same naturalists have recognized the possibility that *varieties* may arise in a species by a process of natural selection, but they deny that species may arise in the same way. To show the inconsistency manifested in this artificial and arbitrary division of nature, it is only necessary to draw attention to the fact that scarcely any two naturalists were agreed as to what belonged to one species, and what to another. Two men studying the same animal forms, in nine cases out of ten, would group them differently; the forms placed by one man under a certain species would be classed with a different species by another. This diversity of opinion about the same individual animals is demonstrative proof that species are *not* separated from one another by impassable barriers, and it furthermore proves that a species is not a unit of creation any more than a variety.

A semblance of truth was given to the doctrine of the permanence of species by the discovery that certain hybrid forms, or crosses between so-called species, were generally sterile, and the dictum that "*animals incapable of common offspring cannot have sprung from common ancestors*," became the test for species. But it is obvious that such a test as this could only be applied in a very limited way, and the great body of animals and plants would have

remained forever unclassified if naturalists had waited to ascertain the genuineness of species by this method. It is evident, therefore, that other methods have to be resorted to to classify the various forms of animated nature, and the only *practical* guides to accomplish this are resemblance in structure. The result is that no two authorities are exactly agreed as to the forms to be placed under a given species.

Mr. Darwin thus summarizes his views, arrived at by long study and observation: "First crosses between forms sufficiently distinct to be ranked as species and their hybrids are very generally, but not universally, sterile. The sterility is of all degrees, and is often so slight that the most careful experimentalists have arrived at diametrically opposite conclusions in ranking forms by this test. The sterility is innately variable in individuals of the same species, and is eminently susceptible to the action of favorable and unfavorable conditions." The opinions thus expressed by one of the first naturalists of the nineteenth century are not to be attributed to prejudice, but they are the result of experimental research, carefully planned and carried out. We are, therefore, compelled to acknowledge that the groups called species are not immutable, but, like varieties, are subject to change.

Let us, then, have a clear idea of what we are to understand by the words Variety, Species, Genus, Order, &c. These are *artificial* divisions which enable us to group together allied forms for the purpose of studying their mutual relations, and the relations they bear to animated nature as a whole. The only *exact* natural division that we possess is the *individual form.* Now, by grouping together individuals that are most nearly alike, we get a Variety; by grouping together varieties that bear the closest resemblance to one another we get a Species, and throwing together the species that resemble we get the Genus.

Now, all naturalists admit that varieties run into one another by *insensible* gradations, and also acknowledge that new varieties may arise by the perpetuation of structural changes which have proved beneficial to the individual and which enable it to cope more successfully with its fellows. The law of the survival of the fittest in the battle for life every one is ready to recognize when they see a hand-to-hand encounter between two pugnacious individuals; the stronger, other things being equal, will surely overcome the weaker.

Nor will any father or mother question the truth of the law of "the hereditary transmission of peculiarities, both physical and mental," for they have abundant opportunity of verifying it every day of their lives in their own children.

Now, those changes of structure called "accidental variations" are the result of inherent tendency on the part of the organism to vary, and of the influence of external conditions. In those instances where the innate tendency to vary is seconded or assisted by external conditions, the variations will be fostered and perpetuated; but if the external conditions are not favorable, then the tendency to vary will not be assisted, and the organism will retrograde, and, in time, disappear. Thus we see that to inherent tendencies to vary, and the influence of the environing circumstances, must be attributed all the diversity of animated creation. The one is the complement of the other.

The two primary laws, then, upon which natural selection rests, may be thus formulated:

1st. *The existence of an inherent tendency on the part of all organisms to vary.*

2d. *The influence of the environment permitting and determining the character* of these variations.

These two primary laws are supplemented by the law of *heredity*, which tends to transmit the variations which arise, and by the law of the *survival of the fittest in the battle for life* by adaptation to external conditions. This latter is a necessary outcome of the second primary law.

Every one is prepared to admit that the external conditions of life, such as climate, food, and soil, are subject to changes, not only of a temporary but of a permanent character. Now, organisms inhabiting a country where such changes are in progress must either change with the external conditions, in order to adapt themselves to the changed state of affairs, or they must be seriously injured and finally exterminated. It becomes, therefore, a matter of the first importance to the organism to keep the *Equilibrium* which subsists between itself and its external conditions. The natural result will be that those variations in the individual which best enable it to restore the equilibrium disturbed by external changes, will be fostered and perpetuated. Now, if these external changes are of such a nature as to favor the *higher developmental tendencies*

of the individual, then development will result; but if these changes are opposed to such *developmental tendencies*, then the organism *must retrograde* to restore the equilibrium, or it must remove to some more favorable territory, or it must Perish.*

Now, it must not be forgotten that the external world has itself a tendency to fit itself for the reception of higher and higher life impressed upon it in the beginning, and hence, the developmental tendencies of the individual have been, in the long run, assisted by the developmental tendencies inherent in the constitution of the Globe.† In the beginning it prepared itself for the reception of life, and brought it forth when the fitting time came. With the advent of the *organic* world, another factor came into play, and assisted the inorganic elements and forces in preparing the world as an abode for higher life. *Every organism reacts upon its environment and tends to improve it, thereby enabling the environment to encourage the development of a still higher organism.*‡

The developing tendencies have continued in operation up to the present time, and, as a natural result, have been followed by the development of higher and higher life.

It is true that there are local and individual exceptions to this onward course of development. Volcanic action, earthquakes, floods, and tempests, &c., have rendered parts of the earth uninhabitable. But taking into consideration all these local checks, I do not think that any rational man will deny that the external world is still developing, and fitting itself more completely as an abode for animated nature. Nor will any rational man deny that the

* It must not be overlooked when we consider what constitute external conditions, that with reference to animals, the vegetable world is an external condition; and, that, with reference to plants, the animal world is an external condition. Climate, soil, &c., are of course external to both.

† The various agencies at work in the inorganic world preparing the Globe for higher life are numerous and powerful. The disintegration of rocks and leveling down of mountain ranges by torrent and flood, and the upheaval of land above the waters, increase the total area of habitable space for higher life.

‡ The law "that organisms are molded in a degree by their habitat," must not blind us to the existence of the complementary law that "the habitat is also in a measure molded by the organism." Many ocean islands owe their origin to the coral polyp; the moss and lichen may prepare a soil which will enable the monarch of the forest to strike its roots.

human race is also advancing, both in numbers and material prosperity; now, man is the acme and crown of terrestrial creation, and, in his person, animated nature is keeping equal pace with the development of the external world. Nay, man is no longer in swaddling bands, but he has wrenched the scepter from the hand of nature, and she, recognizing the fitness of things, acknowledges his superior power and becomes his willing slave, furthering his efforts to make the earth a fitting abode for rational beings.

The low organisms which still abound, in spite of the developmental tendencies inherent in all organized matter, have never met with the proper external conditions necessary to enable these tendencies to develop, hence they have remained stagnant or even retrograded.

We will now illustrate the truth of the laws governing natural selection and examine into the method of their action.

It is a recognized fact that all of our domestic animals have originated from wild species. Under the influence of man's selective power, the breeds have been improved and sometimes completely changed.

Thus, Mr. Darwin, after a long series of observations, has given satisfactory evidence that all of our domestic pigeons are descended from the wild rock pigeon, (columba livia.) Every agriculturist improves his crops by selecting the best for seeding. and every stock-raiser does the same with his cattle, sheep, and horses. Now, what man does on a small scale nature does on a large scale, but the process is the same in both cases.

As a striking illustration of the power of selection in modifying the organism, the new breed of sheep established by a Massachusetts farmer may be quoted. In the year 1791, a Mr. Wright had a flock of sheep, consisting of a ram and some twelve ewes. At the breeding time one of the ewes gave birth to a very singularly-formed male lamb; it had a very long body, and very short legs. When this lamb attained maturity, it occurred to Mr. Wright to try an experiment. He killed his old ram and bred entirely from the new. The result was that this peculiarity was transmitted in several instances, and, by continuing this selective process, he succeeded in establishing a breed of short-legged sheep. As this new breed possessed the great advantage of not being able to jump

fencing, on account of the shortness of their legs, it became quite popular in that section of the State.*

Mr. Darwin has furnished numerous examples of this selective process in nature, both in the animal and vegetable world.

The use and non-use of parts is a powerful factor in the selective process. The case of the Paris amphibians, which escaped from their confinement and entirely lost their gills, is a good illustration of this. Here the gills disappeared for want of use, whilst the lungs became more perfectly developed on account of the increased use to which they were put. The imperfect eye of the mole is another striking illustration. The rudimentary muscles of the human ear is another. Every one knows that these muscles are well developed in nearly all the lower animals, where they subserve the important purpose of shaping the form of the external ear for the reception of sound.

All animals prick up their ears when excited, and this power is possessed in a greater degree by those creatures which, on account of weakness, place their safety in flight when attacked, or in those which live by prey.

As we approach the higher animals, these muscles become more and more rudimentary, and when we reach man we find them so insignificant that they are no longer of any use. Every one is familiar with the physiological fact that disused muscles atrophy or diminish, whilst the more they are used the greater is their development. May we not attribute the rudimentary wings of the penguin to habitual disuse? These creatures inhabit lonely parts of lonely sections of the world, and flight from danger is with them a rare necessity. The long disuse of the wing resulted in their retrograding as appendages of flight. On the other hand, we find the ostrich occupying sections of the world where danger from enemies is great; we might expect, therefore, that this bird would have very exalted powers of flight. But it must be remembered that the ostrich occupies a desert region, where food is not abundant; now the quantity of food necessary for a bird of flight of the size of the ostrich would be enormous, much more than he can command. The legs of the bird are, therefore, used more than the wings, and, consequently, undergo enormous development,

* This breed subsequently became unpopular and was allowed to die out.

whilst the wings, from want of use, almost disappear. Here, then, we have two examples, drawn from diametrically opposite conditions, where the resultant of external forces has produced a like effect in the same organ. In the one case, however, the leg development makes up for the wing degradation, and is, indirectly, the result of deficient food. Thus, the presence of danger and deficient food supply have assisted in making the ostrich what he is. I say assisted, for there were doubtless many other causes at work also.

We will now endeavor to illustrate the working of the law "of the survival of the fittest in the struggle for life," which is one of the most important sub-factors in the process of natural selection.

Let us take a specified area of ground, and let us suppose that this area is capable of bringing to maturity a certain number of plants, and no more. Now, we will scatter over this area ten times the quantity of seed which would be necessary to fill the allotted space. It is evident that only one seed out of ten can possibly reach its full development, and, if we consider any individual seed, there are exactly nine chances against its coming to maturity. Now, in a case like this, what happens?

A struggle for existence commences at once, and those seeds which are favored in any way whatsoever have the best chance for surviving. The most trifling circumstances—a few rain-drops more or less, the presence of a little clod which might interfere with growth, or anything which would give one seed a hair's-breadth advantage over another—would determine its selection.*

Now, this fight for life is constantly being waged throughout nature's wide field, and it is by the survival of the fittest that she makes her selection. However slight an advantage may be, or however acquired, nature selects that advantage and assists in perpetuating it. The hypothetical illustration just made use of will enable us to appreciate that statement of Mr. Darwin which sums up in a nutshell his greatest contribution to the theory of natural selection.

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* The relation existing between population and food-supply, formulated by Malthus, here comes into play. By the premises of our proposition, only sufficient nourishment exists to bring to perfection a given number of plants—all beyond that number must perish. This truth recommends itself so strongly to the understanding that it may be regarded in the light of an axiom.

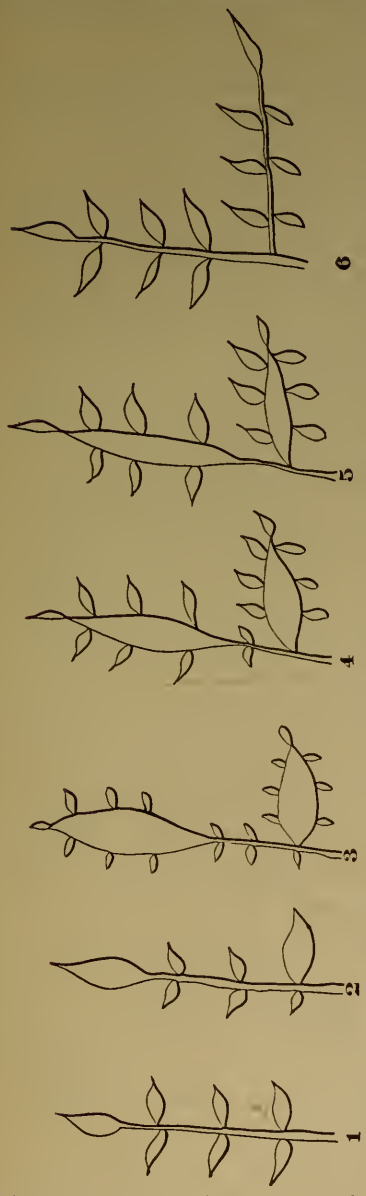
He says, (Origin of Species, page 168:) "As natural selection acts solely by the preservation of profitable modifications, each new form will tend, in a fully-stocked country, to take the place of, and finally to exterminate, its own less-improved parent form and other less-improved forms with which it comes into competition. Thus *extinction* and *natural selection* go *hand in hand.* Hence, if we look at each species as descended from some other unknown form, both the *parent* and all the *transitional* varieties will generally have been exterminated by the very process of the formation and perfection of the new form."

To assist the mind in grasping the ideas here conveyed, the attention of the reader is invited to the following diagrams, which will serve to illustrate how one species might replace another in a *given* territory, under the influence of variations perpetuated by natural selection. He will also be able to appreciate the great truth that the very conditions which insure the growth of a new species will certainly tend to prove fatal to the old, that the new species can only grow at the expense of the old, and that the growth of the one presupposes the decadence of the other. This follows as a natural result of the law of Malthus just referred to. Thus we are enabled to give a satisfactory explanation of the almost entire absence of connecting links between great natural groups.

In cut 1 we have a so-called species, consisting of seven varieties, occupying a given territory where external conditions, proving favorable, have determined its abode. We will suppose that this group of animals, owing to the long existing equilibrium of external conditions, has reached its maximum number.

We will now suppose that a slight change of climate or food-supply takes place, and that two of the varieties attain a slight advantage over the others by adapting themselves a little better to the changed conditions. Now, the causes which first led to this slight advantage will tend to make these favored varieties still more predominant, and, by the conditions of the law governing population, in proportion as these varieties increase, the others must diminish, either by seeking a new abode, or by adapting themselves to other conditions in which they avoid competition, or they must gradually die out. In cut 2 we see the predominant varieties growing at the expense of the others, and they have monopolized the greater part of the available territory. Whilst

this is going on, variations occur in certain indidivuals of the two predominant varieties, and these variations are of such a nature as to give them an advantage over the other members of the predominant varieties, (we are supplying a gradual but continuous change of external conditions,) the result will be that a number of sub-varieties will arise. Let cut 3 represent this state of things. Seven *sub-varieties* have budded from each of the predominant varieties, whilst the old varieties have been further reduced in size, owing to the disadvantageous competition with which they have had to contend. The fourteen sub-varieties continue to increase by the very conditions which first set them going, and they now materially encroach on the parent predominant varieties, which, at the same time, begin to diminish. Cut 4 shows this condition of affairs. Of the old varieties, three have entirely disappeared, and the two remaining are very much reduced. The old predominant varieties are also much reduced, whilst the sub-varieties are increasing in importance.



In cut 5 the two old varieties which remained have disappeared, and the old predominant varieties are reduced to almost nothing. In cut 6 we see the transformation completed, the last remaining members of the predominant variety have disappeared, and we have two entire new species,

consisting of seven varieties each, in the place of the old original species.

Now, the length of time required to bring about such a transformation would depend upon the stability of the external conditions. Nor must we suppose that the new species would necessarily occupy a higher plane of development, for this would depend upon the *nature* of the changes in the external conditions. If these were favorable to a higher development, the new species would also be higher; but, on the other hand, if the external conditions were not of such a character, the new species would be degraded in the scale of being. If the external conditions should continue to degenerate, the resulting new species would occupy a still lower plane; and the time might arrive when the territory might become entirely unfit as an abode for organic life; organic life would then necessarily disappear.

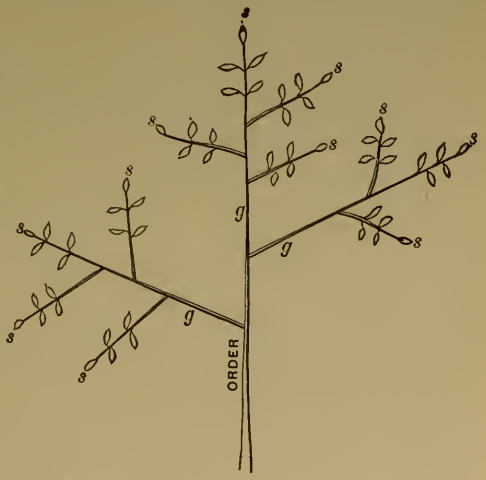
Nor does this fact in any way militate against the existence of *inherent tendencies toward a higher state of being* on the part of the individuals concerned; it only shows that these *higher tendencies* require *higher conditions* for their expansion, and, if these higher conditions are not forthcoming, the individual cannot develop into a higher form in spite of the innate tendency so to do. Thus it will be seen that the external conditions are as much of a necessity to higher development as the inherent tendencies themselves.

What we have shown taking place in a small group or species, may, by the continuous operation of the same causes, give rise to new genera, new orders, and new classes, and new grand divisions.

Let us broaden our limited territory until we have compassed the habitable world, and let us enlarge our small group to the embracing of the whole animal kingdom; the law of Malthus governing population will still remain in operation, and the laws of natural selection will still obtain. Now, the twig with its seven leaves, which we have made to represent a species with its varieties, expands into the foliage of a mighty TREE, whose trunk and branches, made up of preceding forms, have long since perished, and whose remains lie buried in Mother Earth whence they sprung. If the reader has followed the argument, he will at once appreciate the fact that the growth of the foliage of the tree depends upon the death of its branches, (*upon the extinction of the parent forms which gave birth to existing life;*) and, by the very conditions

of the tree's existence, he would not expect to find any transitional *living* forms *beyond the smallest group or species.*

Thus, the individuals constituting a variety are most nearly alike, but when we compare two *typical* individuals of two different varieties belonging to the same species, we find a marked divergence of structure, though the two varieties may run into one another by insensible gradations, as is frequently the case. Now, if we compare two individuals belonging to two more widely separated groups, called species, this divergence of character is still more marked, and we also find the transition between these two greater groups more abrupt. This divergence becomes greater and greater as we recede from the variety, and fewer and fewer do the transitional forms, or connecting links, become. This will be better understood by reference to the diagram, where the leaf represents the variety, the smallest clump of leaves the species, and the next in size the genus, next the order. Now, we would naturally look for greater similarity of structure, and more numerous transitional forms, among the members of varieties comprising a species than we would among members of different species.



These resemblances and connecting links would be further lessened between genera, still less between orders, &c. Keeping in mind the great fact that the sub-varieties (new leaves) arise from the old varieties (old leaves) by a *budding* process, and grow at *their expense*, the reader will no longer have any difficulty in appreciating the great truth that the parent forms *must retrograde* as the new forms develop—as the new leaves grow, the old fade away, and, finally, fall from the TREE, and their remains constitute the fossil forms which strew the bosom of Mother Earth. Hence, *transitional living* forms are not to be expected beyond the smallest

group of leaves or species. He may justly expect to find some *transitional fossil* forms, and, later on, the evidence so furnished will be examined.

As we contemplate this majestic tree, whose wide-spreading foliage overshadows the whole Earth, the thought that it required *fitting soil* for its growth at once occurs to us. In other words, organic life could not have developed into higher forms, in spite of the existence of inherent tendencies, unless external conditions had been *favorable* to such development. As well might we expect the acorn, thrown upon the barren sands, to bring forth the sturdy oak. Within the narrow compass of its seed the tree lies, *potentially*, but it requires favorable conditions to bring it to maturity. Hence, organic development into a higher state of being depends upon,

1. The INHERENT tendencies on the part of the individual to develop into a higher form of being, and,
2. The INHERENT tendencies in the globe to fit itself for the reception of this higher form of life.

Under the influence of these two great laws, which, for want of a deeper knowledge of *secondary laws*, we can only define as decrees of Almighty Power, the onward march will not cease until the world has fulfilled the great mission set apart for it by the Great Designer. The progress of organic life as a whole has merged itself into the progress of man, who is its great representative.

As man increases in power and wisdom, external nature assumes more and more the place of a servant, and no longer exercises, in the same degree, those powers of selection which, prior to man's appearance, she wielded with such stupendous effect. Just in proportion as man advances, *Artificial Selection* takes the place of *Natural Selection*, and he stamps the seal of his will more and more upon the lower creation. The wild animals, not suitable for domestication, disappear before his advancing footsteps, and the vegetable kingdom also acknowledges his superior power, and molds itself according to his dictates.*

* In the widest sense, man is a part of nature, and, in the same sense, all his acts are natural acts. The continued Evolution of the world under his dominion is, therefore, as much a natural process as it was before, but we are forced to make the distinction in order not to confound the workings of Nature expressed through him and the workings of Nature expressed through agencies external to him.

The time will inevitably come when every foot of Earth fitted for Man's habitation will be occupied by him, and, as a natural result, those animals and plants which are not subservient to his well-being will disappear. The dividing lines between natural groups will thus broaden with man's advance, by the extermination of intervening species and genera. The time is not far distant, comparatively speaking, when the existing gap between man and the lower creation will be immeasurably widened by the destruction of all the higher apes.

The Feline tribe, which now numbers among its members the lion and the tiger, monarchs of the forest, will have its sole representative in the pet of the household; and its close affinity to the fierce tyrants of the animal kingdom will become a matter of tradition. Such will be the fate of all the members of the lower creation if brought into competition with man. They must either become his servants and do his bidding, or they must perish.*

The absence of transitional living forms has been one of the chief arguments brought forward by the opponents of Evolution; with how much better show of reason will the opponent of the doctrine be able to urge this same argument five hundred or a thousand years hence?

When the opponent of Evolution succeeds in ridding himself of the notion of the *linear progression of all living forms*, and accustoms himself to represent nature as a tree with many diverging branches, then the difficulty, based upon the absence of connecting links, will disappear. According to his conception of Evolution, he is quite justified in expecting a *regular gradation of living animals* connecting reptiles with birds, birds with the lower mammalia, and so on, up to man in a regular and unbroken series of imperceptibly modified individual forms.

Under the influence of these erroneous notions, the most absurd questions have been asked, and the most puerile statements have been made by the most intelligent men.

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* At the present rate of increase in population, another thousand years will witness the extermination of all the higher wild animals, and a large part of the less important which are not domesticated.

CHAPTER V.

ARGUMENTS FOR EVOLUTION DRAWN FROM PALEONTOLOGY.

Ye who study with reverential awe the writing of the inspired page, treat not with indifference nor disdain the teachings of the characters engraved on the rock-ribbed Earth by the same Divine Hand.

Having passed in review some of the chief facts presented to us by living nature, we will now consider the evidence which Geology and Paleontology supply in favor of the doctrine of Evolution.

According to the theory which has been set forth in the preceding pages, transitional living forms are not to be looked for, but we should expect to find some transitional *fossil* forms; and these we do find.

That they are not more numerous is because of our limited knowledge of the crust of the Earth, and the destructive influence of time upon these buried remains. As our acquaintance with the various strata increases, more and more evidence is brought to light. The record of the Earth's history, written on the face of the rocks, is not entirely obliterated by time's eroding hand; here and there a detached fragment has been discovered and deciphered, and enough has already been found to put beyond reasonable doubt the general tenor of the whole. Just as the Philologist searches among the remains of dead languages to seek the origin of existing tongues, so the Paleontologist delves into the bosom of the Earth to find the remains of that life from which existing life has sprung.

The earth which we inhabit may be compared to a hollow globe, one yard in diameter, with sides less than a half inch in thickness, filled with a molten mass. The thickness of the shell of such a globe probably bears about the same proportion to the diameter that the crust of the earth does to its diameter.* Of this shell,

* Notwithstanding the opinion of some scientific men to the contrary, there is hardly a reasonable doubt that the central parts of the earth are in a molten condition.

about fifteen miles have been explored by the geologist. Lofty mountains, croppings of strata, and deep mines are the means which he makes use of to obtain a knowledge of the earth's crust. The fossil remains which lie scattered here and there in these various strata are the records which nature has preserved, and the study of these records demonstrates the great truth that life on the globe has been gradual and progressive. As we descend the scale of the strata, the type of life becomes lower, and the higher animals disappear and are replaced by those of a more degraded organization, and finally, when the lowest rocks that have yet been examined are reached, the only trace of life is the Eozoon Canadense, an animal belonging to the lowest type of life. But there must have been a time when no life existed, and this little creature must have been preceded by many generations of still lower organisms, but which have left no trace behind them. Had this lowly representative of the animal kingdom not possessed a shell, it also would have perished, and the fact that life existed on the globe at that remote period would only have been a matter of conjecture.

The history of the earth's crust, in its relation to life, may be divided into two great periods—the azoic and the zoic.

The AZOIC,* or period of no life, extends from the time when the earth, separated from its parent, assumed an independent existence up to the appearance of life. It therefore embraces that stage of its history during which it was fitting itself for the reception of life, and this is, by far, the longest period of its history.

The ZOIC,† or life period, extends from the first appearance of life up to the present. With reference to the forms of life which came into being at successive epochs, the zoic period may be divided into seven ages, each of which is distinguished by the appearance of a higher type of life.

First.—There was first an age in which only the lowest forms of life existed, probably very similar to existing protozoa.

The only remains of the later period of this early life yet found is the delicate shell of the *Eozoon Canadense*, which belongs to the same class as existing foraminifera, and which was discovered some years ago in the Laurentian strata of Canada. These rocks belong

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* Azoic, from Gr. *a*, without; and *zœ*, life.

† Zoic, from Gr. *zœ*, life.

to the oldest group yet investigated by the geologist. The foraminifera,* though classed with the *monera*, the lowest existing type of animal life, are endowed with a shelly covering, pierced with numerous minute holes through which the soft creature, which is nothing more than a uniform mass of protoplasm, projects its *improvised* arms for the purposes of feeding and propelling itself.†

At this remote period, the waters must have literally swarmed with lowly organized life, both animal and vegetable. But the great majority of these organisms, being soft and perishable, have left no records in the rocks. Such would have been the fate of the Eozoon Canadense had it not possessed a shelly envelope. We, therefore, find that the geological record jumps suddenly from this low Eozoon Canadense to corals, shell fish, and articulate animals, and the appearance of these creatures ushers in the

Second Age.—During this period, the four lower grand divisions of the animal kingdom, *Protozoa*, *Cœlenterata*, *Mollusca*, and *Annulosa*, were pretty well represented, and sea weeds abounded. As yet there was no land life, and the Annulosa just referred to belonged to the water species only. This age has received the name *Silurian*, from a locality in Wales, where the rocks in which these fossils were found were first carefully studied. The latter part of this period is marked by the appearance of fish, and this ushers in the

Third Age, or Age of Fishes.—Besides the animals above named, the waters now teem with fish. The land is being gradually elevated above the waters, and terrestrial life, both vegetable and animal, begins to make its appearance. The animal life is confined to insects.

This age has received the name *Devonian*, from the county Devon, England, where these fossil strata abound.

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* "In some forms of the foraminifera, the improvised arms or pseudopodia are protruded from only one end of the body, the rest of which is cut off from the exterior by the skeleton, as in Gromidae, &c."—*Huxley.*

† "The typical *monera* consist of a particle of gelatinous protoplasm, in which no nucleus, contractile vacuole, or other definite structure, is visible; and which, at most, presents a separation into an outer, more clear, and denser layer, the *ectosarc;* and an inner, more granular and fluid matter, the *endosarc.*"—*Huxley.*

Fourth.—There was then an age when the continents, which were in process of formation during the latter part of the preceding period, now increased rapidly, and were covered with a rank vegetation, in which palms, tree-ferns, and other endogens held the chief place. It was during this age that the *immense* coal deposits were formed, and hence it has received the name *Carboniferous*, or age of coal plants. Amphibians and the lower *Reptiles* now make their appearance. The gradual development of land life ushers in the

Fifth Age.—Reptile life now abounded, and the rocks of the period are so rich in their remains that this age has received the name *Reptilian*. Birds now make their appearance, and become very numerous toward the latter part of the period. The lower mammalia, represented by the Marsupials, also begin to appear during the latter part of this age, and their advent ushers in the

Sixth Age, or Age of Mammals.—During this period, the lower creation reaches its acme of development, and the forests swarm with huge monsters, among which the mastodon held the most conspicuous place. Like the huge reptiles of the preceding age, these giants of the animal kingdom gradually grew less, and some of the higher mammalia developed into apes, and these into still higher forms. The man-like ape now receives a living soul, and the

Seventh Age, or Age of Man, dawns upon creation.—And now a change comes over the face of nature, and man, as the most exalted of all created things, assumes his place at the head of Creation. Under the quickening influence of the spiritual life breathed into him, the animal part of his nature has been gradually softened and made subservient to the higher nature united with it, and this progress will not cease until the lower is completely subjugated, and the spiritual part of his being will then reign untrammeled.

For convenience of study, these seven ages may be grouped under three grand divisions or times:

I. Primary or Paleozoic Time, (Gr. *Palaios*, ancient; and *Zœ*, life,) which embraces,
   (1.) The age of Protozoa, or Laurentian age.
   (2.) The age of Mollusks, or Silurian age.
   (3.) The age of Fishes, or Devonian age.
   (4.) The age of Coal plants, or Carboniferous age.

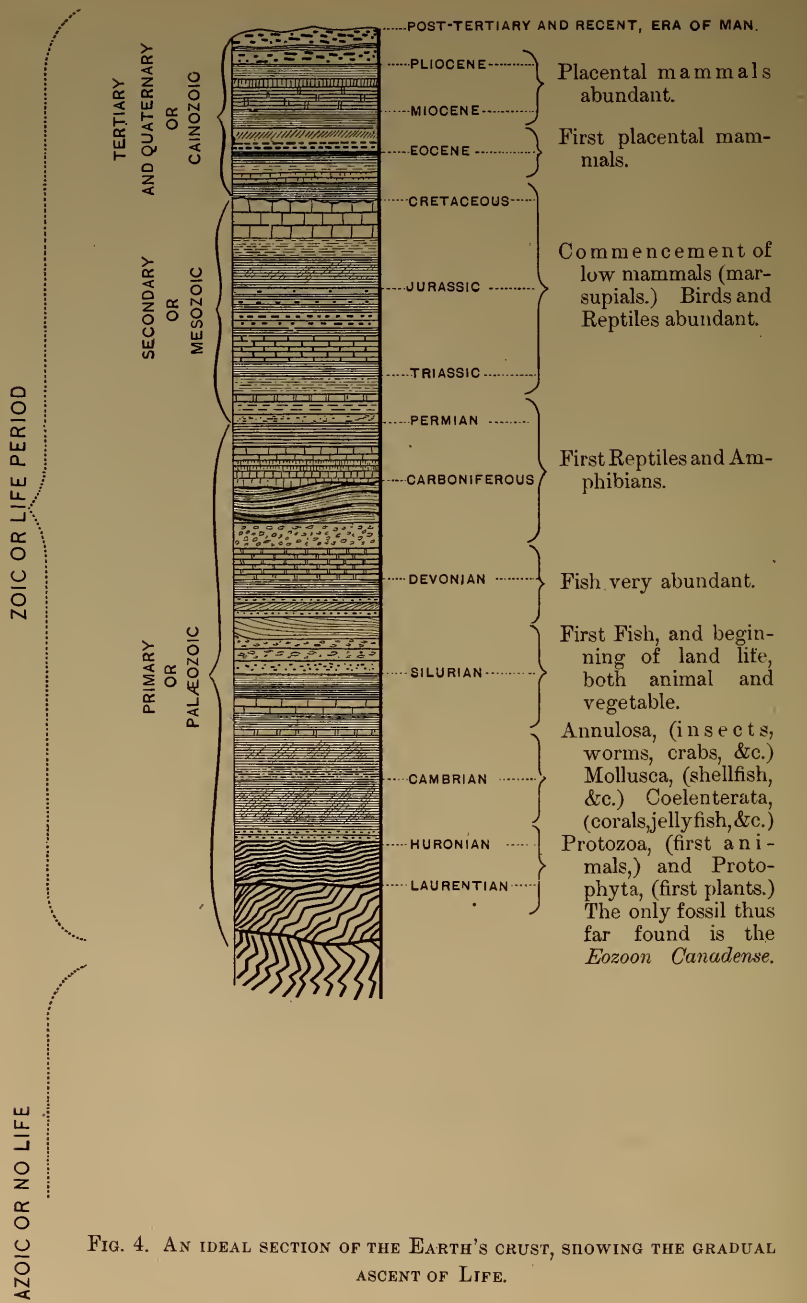


FIG. 4. AN IDEAL SECTION OF THE EARTH'S CRUST, SHOWING THE GRADUAL ASCENT OF LIFE.

II. Secondary, or Mesozoic Time, (Gr. *Mesos*, middle; and *Zœ*, life,) embracing the age of Reptiles and Birds.

III. Tertiary, or Cenozoic Time, (Gr. *Kainos*, recent; and *Zœ*, life,) which includes the age of Mammals and the age of Man.

Fig. 4 represents an ideal section of the crust of the Earth, in which these divisions may be more conveniently studied.

It will be observed that animal life has made its appearance on the globe by a gradual process of development from the lowest to the highest forms. As we ascend the scale of the strata, higher and higher life makes its appearance, until the highest of all, man himself, is reached.

Comparing existing life with that of the past, it is found that many of these forms are now extinct. Thus, of all the species of fish heretofore discovered in the rocks of the Devonian age not one belongs to existing species. Among the ancient reptiles were found the Icthyosauria, Pleiosauria, Pterosauria, and Dinosauria. None of these animals have representatives among the living.

These examples might be multiplied indefinitely, but the few cases cited will serve to teach us that, from the study of the Earth's strata, we may draw two very important conclusions.

1. That the Earth, and the Life on its surface, have not always been as they are now.

2. That the type of life has gradually advanced from the lowest to the highest, and that this advance has not been brought about by *sudden acts of* Creation, but that the creative process has been *continuous*, by the Evolution of preëxisting forms.

It has already been shown that we are not to expect transitional living forms beyond the smallest group or species, that by the very process of Evolution these forms would necessarily be exterminated; but it does follow that we are to look for transitional fossil forms, and the evidence so furnished will now be adduced. Before doing so, however, it is necessary to call the attention of the reader to two very important facts: first, the *imperfection* of the geological record, and, second, the *limited* area which has been explored by the Geologist.

No one will deny but that a very insignificant portion of the Earth's crust has been examined by man. Here and there a hole has been bored and a few remains exhumed, or the miner, in pursuit of treasure, has discovered a few scattered fragments. The

alluvial deposits of great rivers have furnished no small proportion of the remains which fill our museums. But, granting that it were possible for man to make a thorough exploration of the strata of the Earth, what proportion of fossil remains, as compared with the life existing at the time those remains were deposited, would he expect to find? Let any one calculate the chances of a dead animal, thrown hap-hazard on a plain or in the bed of a river, leaving any fossil remains behind it. The destructive agencies of nature, which are even now so potent in obliterating all traces of organic remains, were infinitely more active and powerful during geologic time. Natural forces then displayed themselves on a scale of grandeur of which we cannot now form the faintest conception. But, notwithstanding the limited area explored, and the imperfection of the record, the researches of the Geologist have brought to light evidence which puts the doctrine of Evolution beyond the pale of reasonable doubt.

If any ordinarily intelligent man were asked to name two groups of animals which he thought were most widely separated from one another in organic structure, he would be as likely to mention Birds and Reptiles as any other. For what two creatures could be more distinct than, say, the alligator and the common barn-yard fowl? Yet, notwithstanding the immense difference in structure, there is the strongest evidence in favor of the belief that the bird-form of animal is derived from the Reptilian form, of which we have assumed the alligator to be the type, by insensible gradations.

The chief characteristics of living birds are familiar to all. They are feathered; they possess wings, and the great majority can fly, though in some, as in the Penguin and Ostrich, the wings are rudimentary and insufficient for flight; their jaws are *toothless*, a roughened condition of the mandible taking the place of teeth; they walk on two feet; their bones are hollow, to unite the greatest strength with the least weight, and the bones from which the tail feathers are given off are glued into a mass. Such are some of the superficial points with which most intelligent persons are acquainted.

Living reptiles differ more widely among themselves than living birds. Thus the snake, lizard, alligator, and turtle are all classed under reptiles. The snake runs into the lizard by almost insensible gradations, as every one has had occasion to observe who has

ever visited a zoological garden where a variety of snakes and lizards are kept. The lizard and the alligator are more widely separated, but Paleontology brings them close together. The alligator and the tortoise are still more widely distinct in their appearance.

Of these various reptilian forms, we will select that of the alligator as being the most typical. The chief superficial characteristics of this typical living reptile are, an elongated body covered with a horny skin, resembling a coat of mail, which renders him almost invulnerable; four legs, which are so placed that the animal's natural position is prone upon the belly, the legs being better adapted for swimming and crawling than for walking; its tail is elongated, tapering to a point; it has enormous jaws filled with strong teeth, which are placed in distinct sockets. Whilst the greatest possible difference exists between the bird and the alligator in external appearance, yet in internal organization they resemble closely, particularly in the structure of the digestive and reproductive organs. The vascular apparatus differs from that of the bird in being so arranged as to insure a mixture of pure and impure blood in the general circulation.* Both birds and reptiles are oviparous;† but, in the case of birds, the eggs are hatched by the warmth of the mother's body, whilst with reptiles the heat of the sun performs the same office. Notwithstanding the contrast presented by living birds and living reptiles, the researches of the Paleontologist afford us demonstrative proof that birds and reptiles were once closely united, and that the one was derived from the other by insensible gradations of form. Thus, fossil remains of birds have been found where the tail bones are elongated, not unlike the reptile, and where the wing bones terminated in true claws. Such a bird was the *Archæopteryx*, first discovered in the Solenhofen slates of Germany. Again, in the Cretaceous rocks of the Western States, Professor Marsh has discovered the remains of

* In birds the heart consists of *four* cavities, while in reptiles there are but *three;* the crocodile family, however, offers an exception to this rule, and in them the heart consists of four complete cavities, but a communication exists between the pulmonary artery and aorta, which allows a certain proportion of impure blood to gain access to the general circulation.

† In some reptiles the egg is retained in the oviduct until the young is hatched; these are ovo-viviparous.

birds which possessed *true* teeth. Such are the *Hesperornis Regalis* and the *Icthyornis Dispar.* In the former the teeth are arranged in a groove, whilst in the latter they are placed in distinct sockets. Professor Huxley, commenting upon these remains, says: "Before the discovery of *Hesperornis*, the definition of the class *aves*, based upon our knowledge of existing birds, might have been extended to all birds; it might have been said that the absence of teeth was characteristic of the class birds; but the discovery of an animal which, in every part of its skeleton, closely agrees with existing birds, and yet possesses teeth, shows that there were ancient birds which, in respect of possessing teeth, approach reptiles more nearly than existing birds, and, to that extent, diminishes the *hiatus* between the two classes." "In the *Archaeopteryx*, the upper arm bone is like that of a bird; and the two bones of the forearm are more or less like those of a bird, but the fingers are not bound together—they are free—what their number may have been is uncertain; but several, if not all of them, were terminated by strong curved claws, not like such as are sometimes found in birds, but such as reptiles possess; so that in the *Archaeopteryx* we have an animal, which, to a certain extent, occupies a midway place between a bird and a reptile. It is a bird so far as its foot and sundry other parts of its skeleton are concerned; it is essentially a bird by its feathers; but it is much more properly a reptile in the fact that the region which represents the hand has separate bones, with claws resembling those which terminate the fore limb of a reptile. Moreover, it had a very long reptile-like tail with a fringe of feathers on each side; while in all true birds hitherto known the tail is relatively short, and the vertebræ which constitute its skeleton are generally peculiarly modified." *

So much for fossil birds approaching the reptile type. Now paleontology also discloses the fact that the ancient reptiles assumed the bird-like form. Such are the *Ompsognathus*, an Ornithoscelidan reptile whose remains are abundant in the Mesozoic rocks; and the *Pterodactyles*, or flying reptiles, also numerous in the same formation. There is every reason to suppose that some of these Ornithoscelidan reptiles were bipedal creatures, and walked on their hind legs. Fig. 5 represents a *Compsognathus* restored.

* Huxley: Lectures on Evolution.

The fore limbs are rudimentary, and evidently of but little use in assisting the animal in locomotion, but the hind limbs are strongly developed and are the chief agents in walking.

Fig. 5

Mr. Huxley says: "We have had to stretch the definition of the class of birds so as to include birds with teeth and birds with paw-like fore limbs and long tails. There is no evidence that '*Compsognathus*' possessed feathers; but if it did, it would be hard indeed to say whether it should be called a *reptilian bird* or an *avian* reptile."

The Pterodactyles, or flying reptiles, resembled birds in the fact that the ends of the jaws were often ensheathed in horny beaks, and in some instances, as in the case of *Pternandon*, discovered by Professor Marsh, there is a total absence of teeth. The bones of the skeleton simulated those of birds in possessing air cavities, thus rendering them lighter; and the breast-bone was keeled, as in birds and bats. The flying apparatus resembled that which we see in bats at the present time, consisting of a vast web supported by the fingers and united to the body. In the *Pterodactylus spectabilis*, there are four fingers, three of which are hooked claws, while the fourth is enormously elongated and supports the web. Some of these flying monsters had a span of wing twenty feet in breadth. In reviewing the evidence in favor of birds having been derived from reptiles, if we cannot absolutely affirm that it is demonstrative, we are at least justified in saying that it amounts to the highest degree of probability; and we have every reason to anticipate that the researches of the Paleontologist will discover more conclusive evidence of the close relationship between birds and reptiles.

But we are not to consider that the bird-like reptiles and the reptile-like birds just mentioned are *necessarily* the direct progenitors of existing birds. Some of them are, in all probability, but it is by no means necessary that such should be the case, for they may be only *side branches*, or branches of side branches, of the

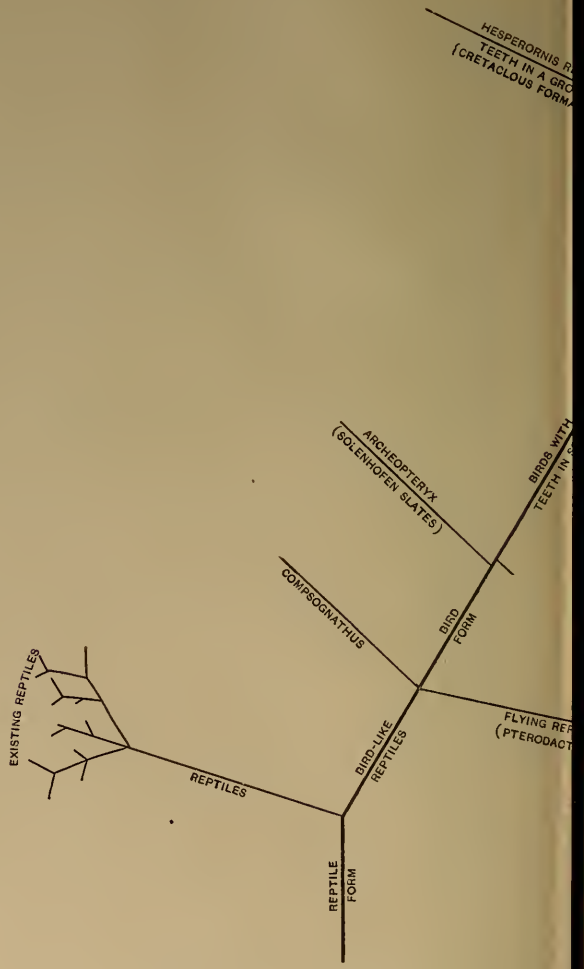
main branch which took its origin at the time when the Reptilian Form divided into two grand divisions, one to bring forth existing reptiles and the other to produce existing birds.

The reader will be better able to understand these statements by studying the diagram of the Genealogy of the Bird.

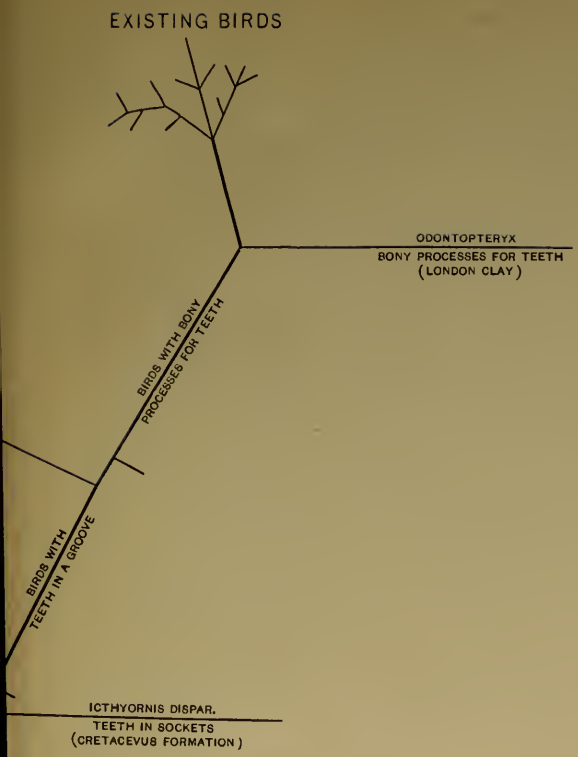
Remembering what has already been insisted upon so strongly in the preceding pages concerning the development of the tree of life, he will readily understand that it is impossible to construct such a chart, with any approach to accuracy, without an intimate acquaintance with *all the* various forms which lived throughout the whole period. This attempt, therefore, must be regarded as simply an effort to bring before the mind more clearly a general idea of the theory of development, and the probable course which that development pursued in the production of Existing Birds and Reptiles.

In the accompanying diagram, existing birds and existing reptiles are represented as springing from a common trunk, called the Reptilian-like Form. This Reptilian Form took its origin from the Amphibian-like Form, which is not represented in the figure, and which will be described in another chapter.

After the division of the Reptilian Form, the left-hand branch, which is destined to produce existing birds, sub-divides into three—the Flying Reptile, the Bird-like Form, and the Compsognathus branches. As we have already seen, this Compsognathus is more of a reptile than a bird, though it resembled the birds in walking on two legs. I have refrained from placing either flying reptiles or Ornithoscelidan reptiles, represented by Compsognathus, in the direct line of bird's descent, thinking it safer to assume that they sprung from a common form of which no traces have yet been found. The Bird form is represented dividing into the Archaeopteryx, and Birds with *teeth in a socket.* The Icthyornis Dispar, which we have seen had *socket teeth*, is represented as springing from this branch, while the branch itself gradually merges into birds which have their teeth placed in a *groove.* The Hesperornis Regalis is the representative of this type of bird. Birds with teeth placed in a groove gradually develop into those that have *bony processes* instead of teeth, represented by the Odontopteryx found in the London clay. The birds with bony processes pass insensibly into those that have no such processes, and from this type existing



HYPOTHETICAL GENEALOGY OF THE BIR


EXISTING BIRDS
ODONTOPTERYX
BONY PROCESSES FOR TEETH
(LONDON CLAY)
BIRDS WITH BONY PROCESSES FOR TEETH
BIRDS WITH TEETH IN A GROOVE
ICTHYORNIS DISPAR.
TEETH IN SOCKETS
(CRETACEVUS FORMATION)

birds have sprung. Now it is not only in the range of possibility, but is indeed very probable, that some of the fossil remains here mentioned may be directly in the line of descent of existing birds, but as this cannot be positively known, it is safer to represent them as so many side branches of the main trunk.

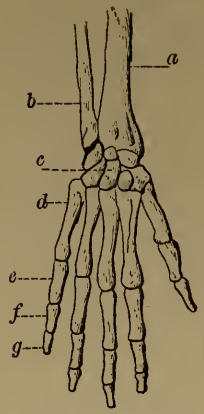
When we consider the wide gap which now separates Birds and Reptiles and contrast it with the near approach they once made to one another, as shown by fossil remains, are we not justified in concluding that they might have sprung from common ancestors?

But Paleontology furnishes yet more conclusive evidence of the truth of the doctrine of Evolution in the series of Equine remains discovered by Professor Marsh in the Pliocene, Miocene, and Eocene deposits of the West.

Before proceeding any further, it will be necessary to draw the attention of the reader to some points of comparative anatomy which it is necessary that he should understand to enable him to fully appreciate the evidence about to be brought forward.

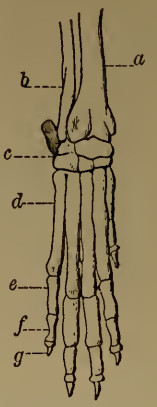
The study of the skeleton of mammals discloses the fact that there is a general plan upon which they are all built, so that a knowledge of one form furnishes the key to all the rest. In Fig. 6 is represented the arm of a man, the foreleg of a dog, and the foreleg of a horse. A glance at these figures will show the reader that the horse's leg below the knee corresponds to the human hand below the wrist; that the horse walks on one finger, and that the hoof is the analogue of the nail of the human hand. He will also observe that the two bones, Radius and Ulna, of the human forearm correspond with the large bone in the horse situated just above the knee. In man and the dog these two bones are distinctly separated, but in the horse they are consolidated into one, and only at the upper end of the radius is the ulna to be traced. (See Fig. 7.) The small bones in the knee of the horse correspond with the two rows of wrist bones in man, whilst the cannon bone of the horse corresponds to the Metacarpal bone in man. On either side of the cannon bone are seen the splint bones. These narrow slips of bone are of the utmost importance to the Evolutionist, for they are the rudiments of metacarpal bones, and their existence first suggested the possibility that the horse might be a descendant of some three-toed ancestor. In the Pliocene and Miocene formations of certain parts of Europe, the remains of the extinct *Hipparion* and *Anchi-*

Fig. 6.



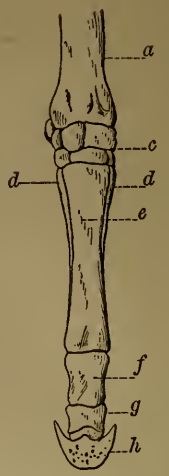
ARM OF MAN.

a Radius.
b Ulna.
c Carpal bones.
d Metacarpal bones.
e First phalanx.



FORELEG OF DOG.

f Second phalanx.
g Third phalanx.

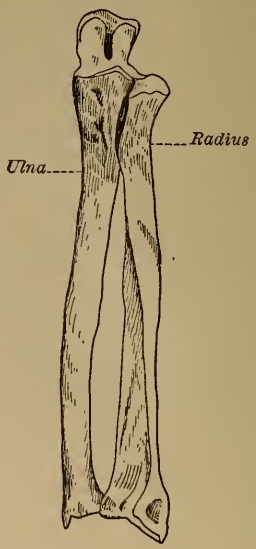


FORELEG OF HORSE.

a Radius.
c Carpal bones.
d Rudimentary Metacarpal bones (splint bones).
e Metacarpal bone.
f First phalanx.
g Second phalanx.
h Third phalanx.

Fig. 7.

HORSE—*Radius and Ulna united.*



MAN—*Radius and Ulna distinct.*

therium have long been known. In the general conformation of the skeleton, and structure of the teeth, these extinct animals present a wonderful resemblance to the living horse. But they differed in the important features that they possessed three toes instead of one, and the division between the radius and ulna was more distinctly marked. In the case of the *Hipparion*, the two side toes are very small, and of little or no importance to the animal in locomotion. In the *Anchitherium*, these side toes are much better developed, and materially assisted the animal in walking and running; the division between the ulna and radius is also more distinct than in the case of the *Hipparion*. In man, the two bones of the leg, called Tibia and Fibula, are separate and distinct; the same is also the case with the dog, but in the horse only a trace of the Fibula exists, joined to the upper end of the Tibia. In the Hipparion, the fibula is much better marked than in the horse, while in the Anchitherium it is still more developed.

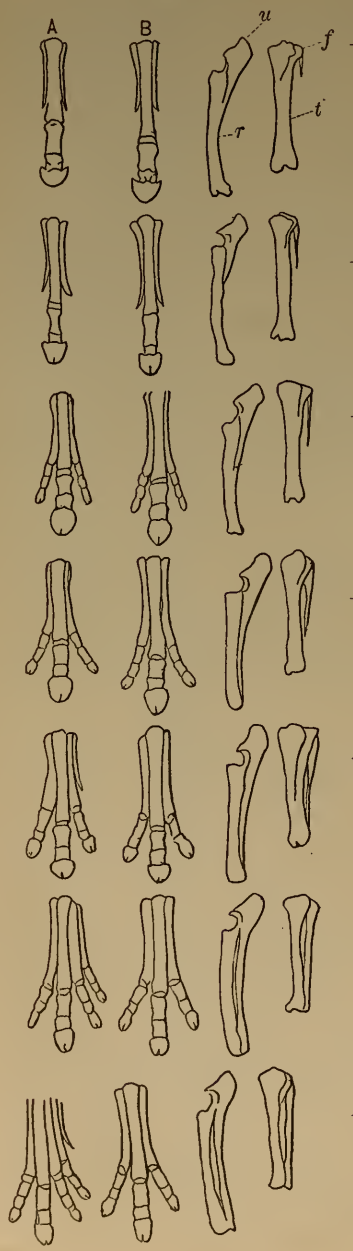
From the above facts, the reader will readily observe that the Hipparion is nearer the living horse than the Anchitherium. Even prior to the discoveries of Professor Marsh, the existence of these two forms, so closely united in their structure, and so nearly resembling the horse, suggested to advocates of the theory of Evolution that they might possibly be the progenitors of existing horses.

Having once recognized the possibility that the horse could have been developed from a three-toed animal, it was but a step to five-toed creatures; and the conclusion that the horse type is but an extreme departure from the general type of five-toed animals was most natural. The series of Equine remains which Professor Marsh has discovered in the Pliocene, Miocene, and Eocene strata of the Western States now demonstrate beyond reasonable doubt the great truth that the living horse has descended from five-toed ancestors by insensible gradations, thus realizing the anticipations of the earlier advocates of the doctrine of Evolution. Taken in connection with the other evidence brought forward in these pages, it places the doctrine of Evolution on the ground of absolute certainty.

The forms composing this series of extinct horses have received the following names:

1. Pliohippus—found in the Pliocene formation.

Fig. 8



Existing Horse.

A Fore foot. *B* Hind foot. *u* Ulna. *r* Radius. *f* Fibula. *t* Tibia.

Splint bones rudimentary.

Pliohippus.—Splint bones more developed; Ulna and Fibula also better developed.

Protohippus, (about size of an Ass.)—Splint bones have developed into lateral toes. Further development of Ulna and Fibula.

Miohippus, (about size of a Sheep.)—Lateral toes enlarged. Ulna and Fibula still better developed.

Mesohippus.—The rudiment of a fourth toe has appeared on the fore foot. Continued development of Ulna and Fibula.

Orohippus.—Fourth toe much better developed. Ulna and Fibula distinct from Radius and Tibia.

Eohippus, (about size of a Fox.)—The rudiment of a fifth toe has appeared on fore foot. Ulna and Fibula well developed.

2. Protohippus—found in the same formation, and corresponding to the European Hipparion.
3. Miohippus—found in the Miocene formation, and corresponding to the European Anchitherium.
4. Mesohippus—found in the same formation.
5. Orohippus—found in the Eocene formation.
6. Eohippus—found in the same formation.

In Fig. 8 is represented the fore leg and hind leg of the living horse, and below, the corresponding parts of the series of fossil remains above mentioned. The gradual transition from the one-toed living horse to the five-toed Eohippus can be appreciated. No doubt future discoveries will render these transitions still more gradual, but even as the series now stands the laws of evidence demand that we should accept the fact that the one-toed horse has descended from a five-toed ancestor.

CHAPTER VI.

BIOGENESIS,* OR THE EVOLUTION OF THE PRINCIPLE OF LIFE.

"God giveth it a body as it hath pleased Him, and to every seed His own body.

"All flesh is not the same flesh; but there is one kind of flesh of men, another flesh of beasts, another of fishes, and another of birds."—*St. Paul.*

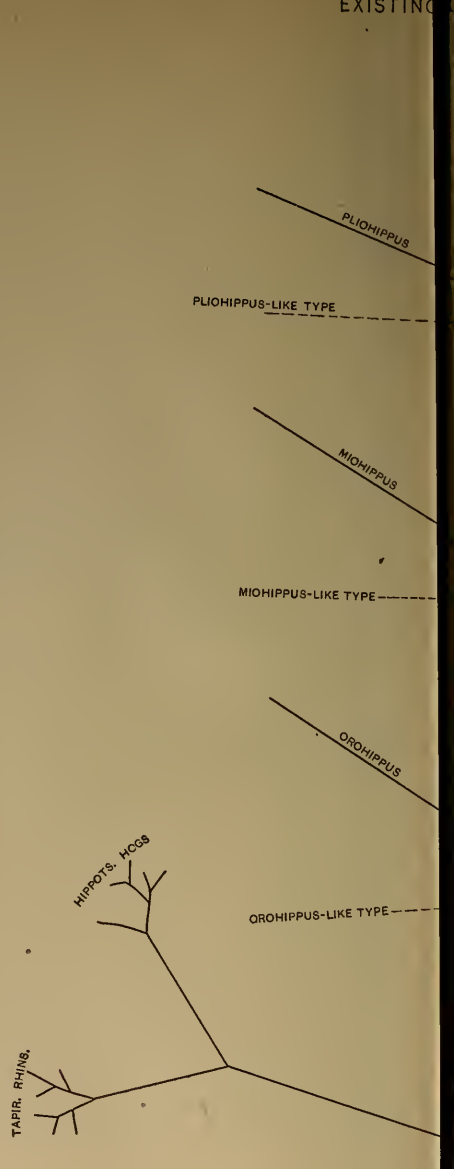
"Life is a pure flame, and we live by an invisble sun within us."

—*Sir Thomas Browne.*

The consideration of the Evolution of the Principle of Life on the Globe would naturally follow that of the Globe from a nebulous mass; but, as hinted at the beginning of the fourth chapter, it was thought desirable to marshal the evidence upon which the theory is based before taking up the more obscure questions concerning the origin and nature of life. Nor need the reader anticipate a solution of these great problems in the following pages; our knowledge of the workings of the forces which constitute life is still altogether too inadequate to enable us to formulate anything like a correct definition of it, or to explain the manner in which it came into being. But the aspiring mind of man, nothing daunted by the difficulties of the way, has striven to attain the heights of positive knowledge even by means of the taper lights which are now in his possession. And these attempts, failures though they be, are to be regarded as an earnest of what future generations will attain to, guided and supported by what has been accomplished by their ancestors.

Intelligence was given to man by the Great Author of all, and this endowment carries with it the injunction, "Whatsoever thy hand findeth to do, do it with thy might;" and it also carries with it the promise, "Ask, and it shall be given you; seek, and ye shall find; knock, and it shall be opened unto you." He who doubts that these great questions will be more thoroughly mastered by the

* From Bios, *Life*, and Genesis.



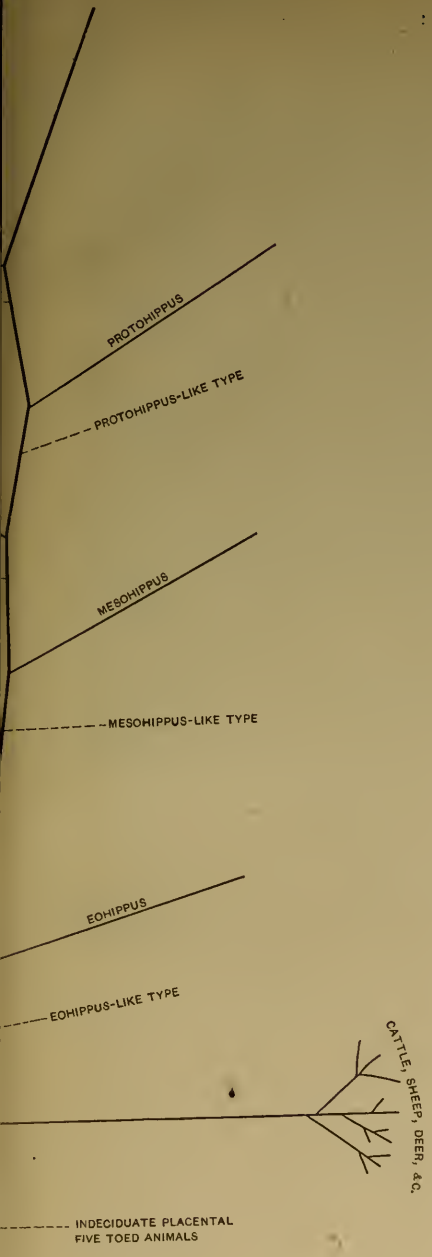
HYPOTHETICAL GE

IT IS NOT NECESSARY TO ASSUME THAT ANY O

ANCESTORS OF

The existing Equine Family embr

RSES—The one Toed Horse



OGY OF THE HORSE

SSILS THUS FAR DISCOVERED ARE THE DIRECT

ITING HORSE.

Horse, Ass, Zebra and Quagga.

human understanding not only fails to read aright the indications written on the dial-plate of human progress by the hand of time, but also calls in question the Divine promises and wise ordinance of things. "Be fruitful, and multiply, and replenish the Earth, and subdue it; and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the Earth." Nature's most secret chambers will respond to his "open Sesame," and expose to his view all her wealth of hidden treasure. This constant progress in the acquisition of wisdom will bring the mind of man to a higher and higher realization of that Being from whom all things flow as from a fountain.

Sundry attempts have been made to embody in a definition some idea of the condition we call life, but in every instance these attempts have culminated in a vague outlining definition of the method of its action, and in no instance touch upon the nature of the thing itself.

Thus, we are told by Schelling that "*Life is the tendency to individuation.*" Richerand defined it to be "*a collection of phenomena which succeeded each other during a limited time in an organized body.*" Mr. G. H. Lewes tells us that "*Life is a series of definite and successive changes, both of structure and composition, which take place within an individual without destroying its identity.*"

Mr. Spencer, in analyzing this great question, carries us through some twenty pages of close reasoning, and, in order not to burden the mind with too much of the truth at once, furnishes a number of relay stations in the shape of preparatory formulæ, whence we can review the field gone over, and prepare our minds for that which is to follow. He finally comes to the conclusion (P. Biology, p. 80,) that, "life is the continuous adjustment of internal relations to external relations."

After carefully studying these various definitions, we discover that we know about as much of the *true nature* of life as we did when we commenced. The *essence* of life is not touched upon by any one of them, and all they do, and they do that very imperfectly, is to give us some idea how life works and manifests its existence. Mr. Spencer's definition is so broad that it takes in the growth of a crystal as much as it describes the growth of a plant or an animal.

The plant or animal, in enlarging its dimensions, assimilates to

itself from external surroundings that material best suited to its purpose; the crystal does the same. The laws governing the relations existing between the animal and its external surroundings determine the degree and character of its growth; so it is with the crystal. When the animal and plant cease to assimilate, they begin to retrograde through the wear to which they are subjected by external conditions; so, when the crystal ceases to enlarge, it begins to diminish through the wearing action of erosion and attrition.

It is obvious, therefore, that this definition, as distinguishing the peculiar process which all mankind, the learned as well as the ignorant, agree in calling vital, is no definition at all, for it embraces the growth of the world from a nebulous mass just as much as it does the growth of an animal or plant.

Even should we define Life as the condition of things resulting from *peculiar* chemical affinities existing among the atoms, we would still be as much in the dark as ever; for we know nothing of the nature of the forces causing chemical action; still less do we know the nature of those forces whose action brings about the *peculiar* results called life. Granting that life is chemical in its nature, that is to say, that life is the resultant of certain obscure forces existing among atoms which may, very properly, be termed chemical, (because concealed,) yet, it cannot be denied that there is *something* in the chemistry of life which is widely different from the chemistry of unorganized or *non-living* matter. Now, it is evident that this *Something*, whatever it be, is the *measure* of the difference between life and non-life, and, therefore, *it* becomes the essential something called life. Now, this *essential something*, whose presence is necessary for the manifestation of that *group of phenomena* which we call life has, very appropriately, received the name of "*Vital Principle*," or "*Principle of Vitality.*" The word is, therefore, but a symbol of *something* which certainly exists, but of whose essential nature we know nothing.

It is nothing more than a confession of ignorance, and stands in the same category with *Gravity*, *Electricity*, *Magnetism*, &c. These terms are used to express the action of certain forces, the nature of which we are, as yet, ignorant. The word Vitality, which has unnecessarily aroused the antagonism of Mr. Huxley and Mr. Spencer, is used in exactly the same sense, that is, to express the existence of an unknown force or forces, whose presence are es-

sential for the manifestation of life. Hence, the old and time-honored definition that "*Life is the manifestation of a Vital Principle*" remains truer, more expressive, and certainly more lucid, than any of the abstruse and clumsy formulas just mentioned, which, so far from telling us what life is, even fail to tell us how it acts.

The reasons urged for dispensing with the word Vitality are just as cogent for doing away with the words Gravity and Electricity, or any other word which we use to express the *limits of our analysis of the ultimate nature of things.*

Mr. Huxley asks the question, (Physical Basis of Life,) "What justification is there, then, for the assumption of the existence in the living matter of a something which has its representative, or correlative, in the not living matter which gave rise to it? What better philosophical status has 'Vitality' than 'Aquosity?'"

The reply to this question is, that the two words have the same foundation; and they are, furthermore, perfectly justifiable, for they express the existence of certain forces, *not previously present,* which compel the atoms of matter in the one case to manifest "Vitality," and in the other "Aquosity."

This question would not have been asked had the propounder fully appreciated its significance. For, after a little reflection, is it not obvious that the great difference between a given number of atoms manifesting certain phenomena and the *same* atoms *not* manifesting such phenomena lies, not in the atoms themselves, (for in both cases the same atoms are concerned,) but in the *Laws* or *forces* which cause these atoms so to group themselves and react upon one another as to give rise to the phenomena in question? *

So long, therefore, as a more intimate knowledge of the true

* Hence it was that the old Atheistical philosophers, more rational than their successors, felt themselves compelled to ascribe to the atoms of matter as many different shapes as there were things in the Universe. Thus, certain atoms formed air, others water, others gold, others silver, and so on. And, consistently, they had no other recourse, for they recognized in the atoms an all-sufficient cause for things, ignoring or disbelieving that there existed an Intelligent Principle which decreed the laws by which the Universe is governed, and that the atoms were like one another in shape, and arranged themselves into groups to form the various things, according to the special laws which watched over them at the time.

The sameness of the atoms is now generally held by all men.

nature of life is denied us by our ignorance of the forces which determine the various combinations of atoms, we cannot hope for a more expressive and more just definition than the time-honored one just mentioned, for a truer definition must define the nature and "*raison d'etre*" of the forces which determine the peculiar combination of matter we call vital. Thus, whilst we may rest satisfied that Vitality, Gravity, Electricity, Aquosity, and all other "ity's" whatsoever, are merely the resultants of the actions of certain forces, yet we cannot do better than accept these terms as designations of the manifestations of the "*Somethings*" peculiar to each. The most careful study of those aggregations of atoms which manifest the qualities termed vital, offers no clue to the secret. The exhaustive analysis of the substance called Protoplasm, which is common to both the animal and vegetable kingdoms, and which forms the ground-work upon which they are built, reveals the fact that it consists of Carbon, Oxygen, Hydrogen, and Nitrogen, and these substances, during the process of dissolution, unite with one another, in proportions, to form carbonic acid, water, and ammonia. But the principle of vitality does not lie in the molecules of C., O., H., and N., of which the protoplasm is composed, but it lies in the *forces* which compel these molecules to assume that peculiar relation. I need not say that up to this time all efforts to produce protoplasm artificially, by combining in the laboratory the elements of which it is composed, have failed, and until this is accomplished, life will remain an insoluble enigma. Moreover, whilst chemical analysis informs us that the substance called protoplasm is the same wherever it may be found, whether it be taken from the cell of the lowest plant, or whether it be taken from the brain of the most intelligent of human kind, yet reason and experience, with no less authority, tell us that there is something infinitely more in the protoplasm, besides the atomic elements of which it is composed, and that the protoplasm of the plant is as *widely different from that of man, as the plant, as a whole, differs from Man, as a whole.* If we are ever able to comprehend the nature of life in general, we may then entertain a rational hope of being able to understand the difference in the forces which govern the protoplasm of the plant and that of an animal, but not till then.

So much for our knowledge of the nature of life.

The next question before us, "When and how did life origi-

nate?" is not less difficult to answer, scientifically, than that concerning its nature.

All men are now agreed, whether they be Theistical or Atheistical in their belief, that there was once a time in history of the world when no life existed on its surface.*

It is evident, therefore, that life has originated, and the When and the How of its coming into being are now the interesting questions for solution.

Three hypotheses present themselves for consideration:

1. The Principle of life, in the shape of living organisms, has been hurled from the surface of some dissolving world, and, falling upon the surface of our own, has found fitting conditions for its development.
2. The Principle of life was Instantaneously Created, and this we will call the theory of *Instantaneous Spontaneous Generation.*
3. The Principle of life was created by a process of Evolution, and this we will designate *Gradual Spontaneous Generation*, or *Generation by Evolution.*

The first theory was suggested by Sir William Thompson and Dr. Helmholtz, and two greater names grace not the annals of modern science. But, in spite of the weight of these two great names, the hypothesis, if not unscientific and impossible, is certainly most unsatisfactory and improbable.

Dr. Helmholtz, referring to the physical objections urged by Zœllner against the theory, says: "Now, in the first place, we know from repeated observations that the larger meteoric stones only become heated in their outside layer during their fall through the atmosphere, while the interior is cold, or even very cold. Hence, all germs which there might be in the crevices would be safe from combustion in the Earth's atmosphere. But even those germs which were collected on the surface when they reached the highest and most attenuated layer of the atmosphere would long before have been blown away by the powerful draught of air before the stone reached the denser parts of the gaseous mass, where the compression would be sufficient to produce an appreciable heat. And, on the other hand, as far as the impact of two bodies is con-

* That class of Atheists who maintained that the world has existed essentially as it is at present from eternity, has disappeared, and given place to Atheistical Evolutionists or Involutionists.

cerned, as Thompson assumes, the first consequences would be powerful mechanical motions, and only in the degree in which this would be destroyed by friction would heat be produced. We do not know whether that would last for hours, for days, or for weeks. The fragments, which, at the first moment, were scattered with planetary velocity, might escape without any disengagement of heat. I consider it even not improbable that a stone, or shower of stones, flying through the higher regions of the atmosphere of a celestial body, carries with it a mass of air which contains *unburned germs.* As I have already remarked, I am not inclined to suggest that all these possibilities are probabilities. They are questions the existence and signification of which we must remember, in order that if the case arise they may be solved by actual observations, or by conclusions therefrom."*

Granting, then, the physical possibility that the first germs of life were transmitted to our own world from another which had undergone disruptive convulsions, still the question, how life originated in that world, remains unanswered. If it be held that the world from which we received life received it from another, and that from another, and so on indefinitely, yet this would amount to nothing more than a constant begging of the question, and would give us no clew as to the origin of life in the Universe.

It is evident that this hypothesis is only a make-shift, and is, therefore, entirely unsatisfactory.

We are consequently forced by necessity to make choice between the two remaining hypotheses.

The merits of each may be embodied under two propositions, which, for convenience in comparing, we will place in parallel columns:

Generation by Evolution, or Gradual Spontaneous Generation.	*Instantaneous Spontaneous Generation.*
1. It gives us a grander conception of the power and Wisdom of the Creator.	1. It does not elevate our conception of Deity as does the other, and it tacitly puts bounds to His power.

* Helmholtz's Physical Lectures.

2. Whilst there are no facts in our possession which directly prove the hypothesis, yet, *reasoning from analogy*, we are justified in concluding that life, like the various forms it has produced, has been brought into being, from inorganic matter, through the agency of *Secondary laws*, that is to say, by an Evolving process.	2. There is not the *slightest scientific* foundation for the hypothesis, and it does violence to all our experience of natural processes.

That generation by an evolving process carries with it a nobler conception of Divine power than Instantaneous Generation has already been sufficiently proved in the second chapter of this work, where we considered the relative merits of the doctrine of Evolution and the doctrine of Special Creation. The argument there brought forward is of equal weight here, the two propositions being in all respects analogous. The reader is, therefore, requested to refer to the argument there deduced.

With regard to the second proposition, a brief historical review of the theory of Instantaneous Spontaneous Generation is necessary, and will illustrate upon what an airy foundation the theory rests.

It was the great English physician, William Harvey, who enunciated the doctrine embodied in the words, "Omne vivum ex ovo," "All life from an egg." Whether this was meant by Harvey to express merely a broad morphological generalization,* or whether he also wished to express his disbelief in the theory of (Instantaneous) Spontaneous Generation, universally prevalent in his time, there is a difference of opinion. But whether Harvey was or was not a believer in the theory, it is certain that he attempted no scientific refutation of it; and the belief that the grub, which make their appearance in all decaying animal matter, were Instantaneously produced, remained unquestioned, even by scientific men, until the distinguished Italian physician, Francis Redi, (1629–1698,) began to experiment upon the subject. He discovered that these worms failed to make their appearance if the fresh meat was protected from free contact with the air by fine wire gauze. From the

* As Mr. Huxley thinks.

results of his experiments, he arrived at the conclusion that the grubs were really produced from eggs deposited by insects flying in the air, which were afterwards hatched by the heat of the Sun.

But the doctrine, which received such a satisfactory refutation at the hands of Redi, was again revived when the microscope, which, in the meantime, had come into general use, revealed the presence of animalculæ in infusions of animal or vegetable matter. The Spontaneous character of these little microscopic creatures was held by two of the most distinguished men of that day, Needham and Buffon, and the weight of their great names once more restored the doctrine of Spontaneous Generation to its original important position in the eyes of the scientific world.

It was reserved for another Italian physician, Lazarus Spallanzani, to demonstrate that the appearance of animalcules in such infusions is really due to the presence of germs which adhered to the vegetable or animal matter, or which existed in the air to which the infusions were exposed. He found that by subjecting the infusions to a certain degree of heat, and then hermetically sealing them, that the animalcules did not make their appearance.

But Needham and Buffon, and their adherents, were not satisfied with this test, claiming that the intense heat to which the infusions were subjected destroyed some peculiar *chemical* property of the infusions, the presence of which was necessary for the production of the germs.

From that time up to within quite a recent period, the scientific world has been divided, some claiming that spontaneous generation does occur under certain favorable circumstances, others maintaining, on the contrary, that it never does happen.

Opinion fluctuated between the two theories according to the results of the latest experiment, and the repute in which the experimenter was held, and it was not until the eminent Frenchman, Pasteur, turned his attention to the subject that the doctrine received its death blow. No man now living has rendered such distinguished services to science as this great Frenchman, and his name will descend to posterity side by side with that of Jenner, as one of the benefactors of the human race.*

* The germ theory of disease, which Pasteur has done so much to further, is still in its infancy, but no one can doubt the future important part it is to play in the prevention and cure of disease.

The exhaustive character of his researches, essentially similar in their nature to those of Redi and Spallanzani, but much more crucial, has set the matter at rest forever; and the impossibility of an organism coming into existence Instantaneously is now universally recognized by the scientific world.*

But if it is impossible for us to realize, experimentally, the conditions under which it is possible for an organism to make its appearance by Instantaneous Spontaneous Generation, are we justified, on scientific grounds, in assuming that it ever did occur, particularly as it does violence to all preconceived notions of the methods of nature drawn from the analogies which she daily presents?

As we have no scientific foundation for the assumption than Instantaneous Spontaneous Generation ever did occur, and as it is contrary to nature's known methods, it becomes our plain duty to accept the only remaining hypothesis which can account for the appearance of organic life on the globe: that of Gradual Spontaneous Generation, or Generation by Evolution. It is true that, as far as realizing, by experiment, the conditions under which the process could take place, this hypothesis rests upon the same basis as the preceding; but the first receives no support from the analogies of nature, whilst the latter, on the contrary, does receive such support; hence, it is obvious that the latter is the more rational theory of the two.

Nor must we ignore, in making our final choice, the strength of the arguments contained in the first proposition, namely, that this latter hypothesis carries with it a grander conception of Almighty Power; the balance before disturbed in favor of the evolving process by the evidence from analogy is now weighted to the ground by the strength of this latter argument, and we are driven by necessity to accept that hypothesis which holds that organic life has made its appearance on the Earth through the medium of secondary laws acting upon matter, that is to say, by an Evolving process.

The successive upward steps which led to the investment of dead matter with those qualities which have received the name of life are concealed from us by a veil which the human understanding cannot now penetrate. But relying upon those promises which

* The exhaustive researches of Prof. Tyndall have confirmed the experiments of Pasteur.

man has received, and which the history of the past has tended to corroborate, are we not justified in the hope that the great problem will some day be solved, and the human mind be thereby lifted one step nigher to the Fountain source of all wisdom and power?

Mr. Huxley and others have suggested that the organic substance which exists at the bottom of many parts of the Atlantic, and which has received the name *Bathybius*, may be identical with the first organic matter which the Earth brought forth. This is a gratuitious assumption which has no foundation in the dictates of sound philosophy. For, if the doctrine of Evolution be true, it necessarily follows that the first organic substance must have been *common* to both the vegetable and animal world, that is to say, both kingdoms of nature had this primordial substance as their point of origin. Now the conditions which gave birth to this must have been *peculiar* to that age of the world, and are no longer existing. It is in the highest degree improbable, therefore, that this primordial substance is any longer evolved from inorganic matter.

The word *Bioplasm** well expresses this common basis from which both vegetable and animal life have sprung. And we may use the words *Phytoplasm*† and *Zooplasm*,‡ to designate the *vegetable* and *animal* substances into which the Bioplasm broke up in the process of its development. The adoption of these distinctive titles would prevent the confusion which must necessarily arise from the indiscriminate use of the word *Protoplasm*§ which is now in vogue.

Thus we are told by Mr. Huxley that Protoplasm is the same wherever it be found, whether it be taken from the cell of a plant, or whether it be taken from the cell of the highest animal. But even if chemical analysis and the microscope fail to tell us the difference, sound reasoning teaches us that, so far from being the same, they differ from one another by the same measure that the vegetable differs from the animal. The one is the veritable egg from which the vegetable kingdom has developed, while the other

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* From Gr. *Bios*, life, and *plasma*, from *plassien*, to form.

† From Gr. *Phyton*, a plant, and *plasma*.

‡ From Gr. *Zoon*, an animal, and *plasma*.

§ From Gr. *Protos*, first, and *plasma*.

is the egg from which the animal kingdom has been produced. Thus from the Biogenetic Egg has sprung the Phytogenetic and the Zoogenetic Eggs, and from these the vegetable and animal worlds respectively.

Whilst we know nothing of the peculiar combination of forces which brought about this development of the Bioplasm into Phytoplasm and Zooplasm, we are still justified in asserting that they consisted in—

1. An Inherent tendency on the part of the Bioplasm so to develop; and
2. An Inherent tendency on the part of the environment to fit itself for the reception of the higher life.

But *why* the inherent tendency to development existed, or *why* an inherent tendency existed on the part of the environment to favor such development, is hidden from us, and, until the human understanding has received further enlightenment, it can only define these forces, as it is compelled to define the TOTALITY of things—they are Decrees of the Divine Will.

CHAPTER VII.

PHYLOGENESIS,* OR THE EVOLUTION OF THE VARIOUS TRIBES OF VEGETABLE AND ANIMAL LIFE.

We have seen in the foregoing chapter that the primordial organic substance, Bioplasm, which had been evolved from the inorganic world by unknown processes, gradually developed into two new substances, Phytoplasm and Zooplasm, from which the vegetable and animal world have respectively sprung.

In the present chapter, entitled Phylogenesis, a general consideration of the tribal history of vegetable and animal life will be entered upon.

As the reader has already seen in Chapter IV, the Evolution of the organic world may be faithfully represented to the mind as a tree, with all its parts of trunk, branches, and foliage. The main trunk, springing from dead matter, represents Bioplasm, or the common basis of life. The first two branches represent the vegetable and animal kingdoms. The subsequent branches are extinct forms, being the various lines of development which life followed in its progress toward the existing order of things.

The trunk and branches of this mighty tree have perished, and their remains are strewn in the bosom of their Mother Earth, but the foliage, representing existing life, still remains to testify to the infinite wisdom and power of that Being who planted the seed thereof, and impressed upon it those laws by virtue of which it has developed into such wondrous beauty and majesty.

The study of the foliage of this tree constitutes the two great sciences of Phytology or Botany, and Zoology. Plant and animal life are so closely identified with man's material well-being that we can easily imagine that his first stores of natural knowledge were drawn from these two departments of nature. Man's knowledge of plant and animal life was primarily confined to a discrimination

* From Phylon, *tribe*, and Genesis.

of what was beneficial and what was hurtful, both in relation to food and personal safety; and it was not until he had attained to considerable intellectual development that his knowledge came to be of a purely speculative character.

The Sciences of Botany and Zoology may be said to have commenced when primitive man first began to recognize the similarity existing between individuals which bear the closest resemblance to one another, thus leading him to construct a classification based upon the existence of these obvious external characteristics. The groups so formed would, in time, receive distinctive name: the name bestowed embodying some peculiarity of external appearance, mode of life, locality, &c. Every savage tribe, however low in the scale of civilization, possesses such an unwritten natural history of the plant and animal life which prevail in its territory.

The North American Indian, as well as the Bushman of South Africa, have names by which these groups are known among them; and in proportion to their intellectual development and extent of knowledge do they divide and subdivide the groups so formed. Thus a very low order of intelligence would teach the savage man to discriminate among such widely-separated natural groups as a snake, alligator, bird, and dog, &c. A little more intelligence would teach him that birds were not all alike, and he would gradually class together those which most nearly resembled one another, and the smaller groups so formed would also receive distinctive names. And so the specialization would continue until limited by the failure of the discriminative faculty or the absence of external differences of structure.

The *popular* classification of plant and animal life of to-day is essentially the same as exists among savage tribes. It is not until the mind has attained to a high degree of intellectual power that it can use its special knowledge of particular things to *re-interpret* the great Universal from which the special knowledge was derived. The infant man uses his discriminating or analytical powers to particularize; the more-developed man, by the light of these known *particulars*, is enabled to reverse the process, thus arriving at a better comprehension of the relations which the *particulars* bear, not only to one another, but to the Great Universal. Thus Knowledge, initiated by analysis, or a process of picking to pieces, is supplemented by Synthesis, or a process of building up. The attitude

of the mind in searching after knowledge is, therefore, analytical and synthetical at one and the same time: analytical, with reference to the Unknown (in the sense of really understanding it) whole; synthetical, with reference to the isolated facts which it thus becomes possessed of, and whose relations to one another and to the whole it is thus enabled to appreciate. This synthetic or architectural process, though exercised to a limited degree by even the lowest intelligence, can only reach its highest perfection in the highly-developed mind well stored with facts previously ascertained by analysis. Hence, in the earliest condition of society, science, properly so called, has no existence, notwithstanding the great number of known facts; but when the mind begins to study the relations existing between these isolated facts, and rises from one generalization to another, then science proper comes into being. Thus from a really unknown, though superficially known, whole, the mind proceeds to specialize, and then makes use of this special knowledge to elucidate this unknown whole, and knowledge becomes science.

The savage, just emerging from a brute condition, in his observation of nature, learns to *discriminate* more and more, and in proportion as intelligence advances does his knowledge become particularized; and this continues until he is able to distinguish from one another the smallest natural groups, or those groups in which there is the greatest possible external resemblance existing among its individual members. Hence it is that all classifications of animal and vegetable life are essentially the same among all low intelligences, for such classifications are based upon obvious differences of external structure which a low intellect is able to distinguish. It was not until the human mind had been more fully aroused to search out nature in all her hidden recesses that the *internal* structure of animals, by means of dissection, began to be studied; and this step, by which the Universal was further particularized, was the first rung of the ladder which has enabled the human mind to attain to the highest generalizations of animated nature yet known.

The practice of dissection doubtless took its rise from the custom of animal sacrifices which prevailed among all early civilizations. The Medical or Priestly Caste (for both were united in the same individuals, the sacred dignity having been acquired through their

knowledge of curing disease and relieving suffering,*) monopolized all knowledge of nature other than the most common, and the curious among those whose duty it was to offer up animal sacrifices were, in time, drawn to the study of the internal organization of the animals which they sacrificed; and the first priest whose thirst after the unknown led him to look with inquisitive eyes upon the internal structure of the brute is to be regarded as the founder of the science of anatomy. No inconsiderable advance in anatomy must have been made by the Hindoos and Egyptians long prior to Greek civilization; and it is more than probable that it was from their writings and teachings that the Greeks first received that bent toward the study of the animal creation which resulted in placing the science of Zoology upon a broader basis.

The first attempt at a division of the animal kingdom, founded upon internal organization, which has come down to us, was made by Aristotle. He divided the animal kingdom into Two Grand divisions—the highest comprehending creatures possessed with Red blood, corresponding to the Vertebrata of modern authors; the lowest comprising those which, in his view, were Bloodless, or provided with a *colorless fluid*, and corresponding to the Invertebrata (having no spinal column) of later writers. The path which this universal genius pointed out has been followed by all of his successors; and the systems of Allian, Pliny, Athenæus, Albertus Magnus, Aldrovandrus, Johnston, Ray, and Buffon, were all constructed upon the internal arrangements and functions of the organs.

The system of Linnæus was the first important advance made in modern times toward a systematic classification based upon the circulatory system. He divided the animal kingdom into *three* great sections:

I. Animals with WARM red blood, and provided with a heart containing four compartments, viz: two auricles and two ventricles. Such are all creatures that suckle (mammalia) and Birds.

II. Animals with COLD red blood, their heart consisting of but *one* auricle and *one* ventricle, *as he believed* to be the case in Reptiles and Fishes.

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* Prior to revelation.

III. Animals possessed of cold white sanies instead of blood, having a heart consisting of a single cavity, which he calls an auricle. Under this head he includes insects and all other low forms, to which he gives the general name of Vermes, or worms.

The celebrated surgeon, John Hunter, greatly improved upon this classification. Though based upon the same peculiarities of the structure of the heart, it differs widely from that of Linnæus, being more accurate and comprehensive.

Hunter divided the animal kingdom into Five great classes:

I. Animals whose hearts are divided into Four cavities—Mammalia and Birds.

II. Animals having a heart consisting of Three cavities—Reptiles and Amphibia.

III. Animals possessing a heart with Two cavities—Fishes and most Mollusca.

IV. Animals whose heart consists of One cavity—Articulated animals.

V. Animals in which the functions both of stomach and heart are performed by the same organ—Jelly-fish and all the lower order of the animal creation.

The great French naturalist, Cuvier, made a great advance upon Hunter's plan, and his system forms the basis upon which the present classification is built. He divided all creatures into Four Grand divisions:

I. Vertebrata—which includes all animals possessing a vertebral column, and whose nervous system is symmetrical—Mammalia, Birds, Reptiles, Amphibia, and Fishes.

II. Mollusca, (*Mollis*, soft,) which have no vertebral column or articulated skeleton. Nervous system unsymmetrical and skeleton of a fibrous or testaceous character. All kinds of shell-fish, cuttle-fish, snails, &c.

III. Articulata, (Lat. *Articulatus*, a joint,)—animals consisting of a series of parts articulated or jointed together. Nervous system generally symmetrical. All insects, crabs, worms, &c.

IV. Zoophytes, (Gr. *Zoön*, an animal; *Phuton*, a plant,) or Radiata. In which he includes all the remaining forms of the animal kingdom.

This system has been modified by later Zoölogists, and the classification now most in vogue divides the animal creation into

I. Vertebrata—Mammals, Birds, Reptiles, Amphibia, and Fishes.

II. Annulosa, (Lat. *Annulus*, a ring.)—This name describes the general type upon which the animals included under this head are built. It embraces all kinds of crustaceans, insects, worms, &c.

III. Mollusca, which embraces all kinds of shell-fish, cuttle-fish, &c.

IV. Coelenterata, (Gr. *Koilos*, hollow; *enteron*, the bowel.)—It includes such forms as the common jelly-fish, coral polyps, &c.

V. Protozoa, (Gr. *Protos*, first; *Zoön*, an animal.)—Under this head are included all the lowest forms of animal life—sponges, amoebæ, infusoriæ, &c.

A comparison of this classification with that of Cuvier shows wide differences, and it expresses more nearly the views of modern Zoologists in relation to organic development. Thus, the forms included under the Articulata of Cuvier are *typically* in advance of the animals included under the Molluscus division. This latter division is, therefore, relegated to the *third* place in the new order. Cuvier's Articulata are given the *second* place in the new system, under the name Annulosa; whilst the old name, Articulata, is retained to distinguish a subdivision of the Annulosa. Again, the Coelenterata of the new embraces the higher forms of his Radiata or Zoophytes, whilst the division Protozoa embraces all the lower forms. The word Invertebrata (without Vertebræ) is used among Zoologists to designate all animals that have no vertebral column, that is, all the animals included under the four last divisions.

No *linear* classification of the animal kingdom, as expressing the relative heights which animals have attained in *organization*, can be true to nature; and this for the obvious reason that the animated creation must be looked upon as the *foliage of a diversely-branching tree*, not as a pyramid, where every successive step represents a higher degree of organization. The only thing a linear classification can do is to show the relative height of the *Types* under which animals are to be classed. But it must not be forgotten that the Type of an animal may be *high* and its *organization low*. Thus, the *Lancelet* belongs to the highest type of animals, the Vertebrata; but in organization it is far below the cuttle-fish, which belongs to the Mollusca.

The foliage which clothes the ultimate twigs of a branch springing from the main trunk low down may be more elevated above the ground than the leaves of a branch given off from the trunk much higher up.

But the labors of zoologists are not yet completed; the classification given above suggests no analogies with the vegetable kingdom; none of the relations between the two are made apparent, and until this is done no classification will adequately express the ideas involved in the doctrine of Evolution.

In the vegetable kingdom the classifications have been almost as numerous as in the animal kingdom. Among the most noteworthy systems which have been suggested in modern times may be mentioned that of Rivinus, 1690, based upon the formation of the corolla; that of Kamel, 1693, based upon the character of the fruit; that of Magnol, 1720, on the calyx and corolla. In 1731, Linnæus promulgated his sexual system, founded on variations in the stamens and pistil. The plants in an artificial system have no necessary affinity in their essential organization, and may be only connected by superficial characters.

"The Linnæan system," says a distinguished botanist, "leads to little more than a knowledge of names, and can only be looked upon as an index to the genera. Though superior to every artificial system previously promulgated, its day has gone by." Some years before Linnæus wrote, the celebrated English botanist, John Ray, divided all plants into Flowerless (cryptogamic) and Flowering, (phanerogamic.) The flowering plants he distinguished as Monocotyledonous and Dicotyledonous, according to the number of seed leaves which the embryonic plant developed during its germination. His labors have formed the foundation upon which all the various natural systems have been built since his time. Of these the classifications of Jussieu, De Candolle, and Lindley are the most important. That of Dr. Lindley is in many respects more philosophical than that of any other. He divided the vegetable kingdom into seven great classes:

I. Thallogens—Flowerless plants, without proper stems or leaves.

II. Acrogens, (Gr. *akros*, summit, and *gennao*, I produce, signifying growth at the summit.)—Flowerless plants with stems and leaves. The principal growth is *linear* or from the summit of the stem.

III. Rhizogens, (Gr. *rhiza*, a root, and *gennao.*)—Flowering plants with a cotyledonous embryos and fructification springing from a thallus.

IV. Endogens, (Gr. *endo*, within.)—Flowering plants. Wood of stem youngest nearest the center. Monocotyledonous and parallel venation.

V. Dictyogens, (Gr. *diktuon*, a net.)—Monocotyledonous endogens with reticulated venation.

VI. Gymnogens, (Gr. *gumnos*, naked.)—Wood of stem oldest nearest the center; seeds naked.

VII. Exogens, (Gr. *exo*, without.)—Wood of stem oldest nearest the center; seeds in a seed vessel.

In order to thoroughly grapple the full significance of the doctrine of Evolution, it is apparent that a classification should be adopted which clearly expresses the analogies existing between the two great kingdoms of nature. Almost the first thing suggested to the mind, when the great trunk from which the two spring is contemplated, is that there should be much in common between the two in the character of their growth and development. A certain relationship has long been appreciated, and this kinship has, in a measure, found recognition in classifications which have been suggested. For example, the term Zoophytes expresses the analogies existing between certain animals and plants. But whilst occasional analogies have been drawn between the two, based upon striking resemblances, yet a full recognition of the entire relationship which exists in their manner of growth and position of mechanical support has never found expression in any classification hitherto suggested.

If the theory of Evolution be true, we should naturally regard such analogies as so many arguments in favor of their common descent from the first germs of life. If we examine a cross-section of the trunk of an ordinary forest tree, as the oak, chestnut, &c., we observe that it consists of concentric rings of hard dense wood, and its density lessens as we approach the bark. On the outer verge of the woody part we come to a soft cellular tissue, the sap-wood, and it is through this that the sap rises to the branches and thence to the leaves. In a short time the channels through this sap-wood become partially occluded by the deposition of solid matters which the sap holds in solution, and the soft cellular tissue

becomes hardened into true wood. In proportion as the channels of the newly-formed tissue become filled up, the less do they enter into the active life of the tree.

The part which the dense heart-wood of a forest tree takes in its life is the same as that which the bony frame-work plays in the life of an animal—that of Mechanical Support.

The dense wood of the trunk and branches gives rigidity to the whole plant, and enables it to hold aloft its canopy of foliage, thus bringing each individual leaf to the sunlight, enabling it to carry on those vital functions which are essential to the well-being of the whole. Here, then, we have a very obvious analogy between vertebrate animals and Exogenous plants, and it rests upon the *Manner of growth and position* of *Mechanical support.*

The growth of an *Exogen* is external, and its support is central; so in the higher animals, embracing all those included under the head Vertebrata, the growth is external and the support central. The bones of an animal, though living, in no sense enter into those vital processes upon which life depends; they merely give support to those softer parts which are the seat of active life, thus enabling the animal to bring itself into relation with its food-supply.

If we examine the cross-section of the stem of an Endogenous plant, such as a palm, a very different state of things is revealed from what we saw existing in the oak. Instead of concentric rings of dense wood, we observe that the woody fibers are isolated from one another by intervals of cellular tissue. We also observe that the center of the stem contains fewer of these fibers and more of the soft tissue than the circumference. In these plants the center of the stem is composed of younger tissue than the exterior. They are, therefore, said to be Endogenous, or Internal growers. The palms, grasses, orchids, lilies, &c., belong to this class.

Endogenous plants find their parallel in the *Annulosa* and *Mollusca* of the animal kingdom. In the creatures embraced under these divisions, the growth is *internal* and the support external. Among the annulosa, the supporting frame may be fibrous or crustaceous; among the mollusca, it is generally of a shelly character.

The annulosa are distinguished above the mollusca by the numerous articulations which enter into their make-up, so the higher Endogens, comprising the palms and grasses, are distinguished

above the tubers. These latter correspond with the Mollusca, whilst the former are analogous to the Annulosa.

The name Acrogens, signifying growth from the point or summit of the stem, is given to that division of plants embracing the Ferns, Mosses, Lycopodia. The Acrogenous growth of these plants is paralleled in the animal kingdom by the radiating growth which characterizes the creatures embraced under the head Cœlenterata. These animals, generally speaking, consist of a central cavity with rays or tentacles arranged around it.

The name *Cœloradiata* would convey a better notion of the general structure of this class of animals than the one now in use.

Under the name Thallogens, Dr. Lindley has embraced all those plants in which the stem and leaves are indistinguishable, and where the structure is homogeneous, consisting entirely of cells. The Lichens, Algae, Fungi, &c., belong to this division.

The Homogeneous structure of these low vegetable forms enables us at once to draw a parallel between them and the class Protozoa of the animal kingdom, for they also consist of a mere aggregation of cells. So closely do the two kingdoms of nature approach one another that it is impossible to draw the line between them.

The Diatomaciæ have repeatedly changed hands between the Zoologist and the Botanist. At present they rest with the Botanist, but there is no telling how long they will be classed with plant life. There is absolutely no microscopical or chemical distinction between Phytoplasm and Zooplasm. The distinguished Zoologist, Rymer Jones, referring to the close relationship between the two kingdoms, says: "Light and darkness are distinct from each other, and no one possessed of eye-sight would be in danger of confounding night with day; yet he who, looking upon the evening sky, would attempt to point out precisely the line of separation between the parting day and the approaching night would have a difficult task to perform. Thus is it with the Physiologist who endeavors to draw the boundary between these two grand kingdoms of nature; for so gradually and imperceptibly do their confines blend that it is at present utterly out of his power to define exactly where Vegetable existence ceases and animal life begins."

The word Homogens, or Homogenous, would well express the

character of growth which distinguishes the lowest forms of animal and vegetable life.

The analogies between the two great kingdoms may be arranged thus:

PLANTS.	ANIMALS.
I. EXOGENOUS.	I. EXOGENOUS.
Growth external. Central frame-work of dense wood, which serves the purpose of mechanical support. Embraces all plants in which the tissue of the center of the stem is *older* than that of the circumference. Trees and shrubs generally, of temperate climes.	Growth external. Central frame-work of bone or cartilage, which serves the purpose of mechanical support. Includes all animals from man to the lowest fish.
II. ENDOGENOUS.	II. ENDOGENOUS.
Growth internal. The densest and oldest tissue is external, and serves the purpose of mechanical support. Examples—Palms, grasses, lilies, &c.	(Includes the Annulosa and Mollusca.) Growth internal. An external skeleton of a fibrous, horny, or testaceous character, which serves the purpose of mechanical surport. Examples—Insects, crabs, worms, oysters, &c.
III. ACROGENOUS.	III. ACROGENOUS.
Growth linear, or radiate. Plants trailing or inconspicuous. Structure simple, approaching homogeneity. Exs. — Ferns, mosses, some seaweed, &c.	(Cœlenterata.) Growth linear, or radiate. Whole animal simple. Tissues soft and approaching homogeneity. Live in an aqueous medium. Exs.—The common Medusa, Coral polyps, &c.
IV. HOMOGENOUS.	IV. HOMOGENOUS.
Embraces all the lowest forms of vegetable life, which consist	(Protozoa.) Embraces all the lowest forms

of nothing more than a mass of cells, so aggregated as to form a botanical individual.

Exs.—Fungi, lichens, lowest seaweed, &c.

In some the structure is apparently so simple as to constitute a single cell, or mass of *Phytoplasm.*

of animal life, which consist of a mass of cells so aggregated as to constitute a Zoological individual.

Exs.—Sponges, foraminifera, infusoria, &c.

In some the structure is apparently so simple as to constitute a single cell, or mass of *Zoöplasm.*

The analogies existing between the two Great Kingdoms become very apparent when so contrasted, and the possibility that they have had a common origin appeals to the mind with greater force. But it is foreign to the design of this work to enter into minute details of classification; and in drawing these parallels, the only object has been to bring before the mind of the general reader the unity of plan which pervades the whole of animated nature, and to strengthen his belief in the probability of a common origin.

We will now attempt to trace the probable steps which life took in its progress from the primordial Bioplasm to the existing order of things.

In chapter IV, under the head of Ontogenesis, incidental reference was made to the fact that in the development of an individual animal from the egg, the embryo, during the various stages of its growth, assumed the form of the *Types* of life beneath it in the scale of being. These Grand Types, to one of which all living creatures can be assigned, may be described as follows:

I. Zoöplastic.

A homogeneous mass of *Zoöplasm*, no definable cell wall, and no distinguishable *nucleus*. The lowest known *Monera*, as *Protamœba*, some phases of *Protomyxa aurantica*, the *Bathybius** of Huxley, &c., are typical examples.

* This substance, found spread over the bottom of the sea in certain localities, consists of a *gelatinous matrix* with *Coccoliths* and *Coccospheres* imbedded in it. The living nature of the *gelatinous matrix* is disputed by Dr. Carpenter. He says, (Microscope and its Revelations:) "The observations made in the Challenger expedition, however, have not confirmed this view; the supposed Bathybius being a gelatinous precipitate, consisting of sulphate of lime, slowly deposited in water to which spirit has been added."

II. Cell.

A mass of *Zoöplasm* bounded by a cell wall; *nucleus* and *nucleolus* well defined. The higher monera generally belong to this type. *Amœba sphærococcus* and Vampyrella are good examples.

III. Membranous or Blastodermic.

An aggregation of cells united to form a continuous membrane, which partially or completely incloses a space or spaces filled with nutritive material. *Magosphoera planula* is a good example. The Sponges belong to this type, and in them a horny net-work is secreted by which the cell colony is supported.

IV. Hollow or Cœlenterata.

The single layer of cells of the preceding type divides into two the external, called the *ectoderm*, and the internal, called the *endoderm*. The hollow sphere attaches itself at one point, develops an opening at the opposite end (the mouth) and becomes slightly elongated. The ectoderm has the morphological value of the skin of the higher animals, and the endoderm corresponds with the epithelium of the alimentary canal. From the former is developed the organs of locomotion and prehension. Sometimes a third membrane, the *mesoderm*, is developed between the two former, but the structures which it represents in the higher animals are never developed to any extent in this type. Such is the general structure of the Hydrozoa.

Prof. Huxley, in describing this type of animals, says: "The body of every Hydrozoon is essentially a sac composed of two membranes, an external and an internal, which have been conveniently denominated by the terms *Ectoderm* and *Endoderm*. The cavity of the sac, which will be called the *Somatic cavity*, contains a fluid charged with nutritive material in solution, and sometimes, if not always, with suspended solid particles, which perform the functions of blood in animals of higher organization, and may be termed the Somatic fluid."

V. Massive or Molluscus.

In this type the hollow creature of the preceding form becomes more massive by the development from the *Mes-*

oderm of the elaborate structures pertaining to the digestive apparatus, and the nervous, vascular, and muscular systems.

The external investing envelope or integument assumes a much firmer character, thus giving greater support to the soft parts within and affording attachment to the muscles. The movements of the animal are generally sluggish and its migrations limited.

VI. Elongated or Annulose.

The gradual development of the preceding type being attended by increasing wants in the way of food, its migratory movements are necessarily increased to supply these growing wants. Such efforts result in further modification of the body, which becomes more elongated to facilitate motion. All parts of the now *worm-like* creature participate in these migratory efforts, and the nervous system, which in the preceding type consisted of scattered ganglia without regularity of arrangement, now assumes a more symmetrical form, and ganglia become developed on either side of the longitudinal axis of the body, supplying both sides with the requisite nervous force and sensibility. Immediately beneath this connected chain of nervous ganglia, a fibrous chord, the *notochord*, becomes developed. This chord, the rudiment of the vertebral column of the succeeding type, gives support to the whole animal and enables it to move with facility in search of food.

VII. Vertebral.

The fibrous axial chord of the preceding type is replaced by a vertebral column, separable into distinct pieces, which may remain cartilaginous, as in some of the fishes, or become converted into true bone, as in the bony fishes and higher vertebrata. The bodies of the vertebræ throw out process on both sides, above and below. Those given off above (or behind) meet and form a canal in which the spinal marrow is lodged; those given off below (or in front) become the ribs. The anterior end of the spinal chord becomes enlarged, and, separating into distinct ganglia, forms the brain, and this is protected by a casing of bone or cartilage. The digestive apparatus is well developed, and a heart composed of two distinct cavities, an auricle

and a ventricle, is evolved. The breathing apparatus consists of gills only, for the animal is an inhabitant of the waters. Such is the type to which all vertebrate animals, from fish up to man, belong.*

The embryological researches of the celebrated Von Baer and others have demonstrated that the young of all creatures, in the process of development from the egg, always pass through the Types of life below them in the scale of being.

Thus, the young of the Cœlenterata must pass through the *three* types preceding it ere it becomes developed into the type to which it belongs. The young of the mollusk must, in addition to these, pass through the cœlenterata type, and, finally, the young of a Veretebrate must pass through the entire series.

If, then, we examine the embryo of a vertebral animal at each stage of its development, we will discover—

1. The Zooplastic stage, in which the nucleus and nucleolus of the primitive or unimpregnated egg have disappeared.†

2. The cellular stage, in which the impregnated egg has regained its nucleus and nucleolus and has become a *Parent cell.*

3. The Membranous stage, in which the egg undergoes cleavage into cells, and the adherence of these cells forms a continuous membrane, the Blastodermic membrane.

4. The Hollow or Cœlenterata stage, in which the Blastodermic membrane divides into *two*, the *Ectoderm* and *Endoderm*, inclosing a space between.

5. The Massive or Molluscus stage, in which another membrane, the *Mesoderm*, is developed, and which subsequently divides into two. The embryo now consists of *four* membranes. The outer is to produce the skin, hair, and nails; the two middle, the digestive apparatus, nervous, muscular, vascular, and osseous systems; the inner, the lining membrane of the digestive canal.

6. The Elongated, or Annulose Stage in which the embryo becomes slightly elongated, and a fibrous chord (notochord) is de-

* The Amphioxus is the lowest living form of the vertebrata. This creature, though classed with the fishes, is, properly speaking, headless and without a vertebral column, the notochord being still intact. The heart is tubular.

† This disappearance of the nucleus and nucleolus as the first step in development is not accepted by all embryologists, though maintained by Hæckel and others.

veloped in its long axis in the substance of the outer middle membrane. Immediately above the fibrous chord a groove is apparent, the "primitive groove," which is destined to lodge the Spinal marrow.

7. The Vertebral stage. Around the fibrous notochord cartilaginous plates appear, which in time become the bodies of the vertebræ. From these plates processes are given off on either side, in front, and behind: those in front become the ribs; those given off behind meet, and, coalescing, form the spinal canal, in which is lodged the spinal chord. The anterior end of this chord separates into ganglia and develops the brain, protected by its casing, which, in all the higher vertebrata, becomes bony. The heart consists of two cavities, and branchial arches exist.

At this stage of development, it is impossible to determine whether the embryo is destined to produce a fish, reptile, bird, quadruped, or man.

Such are the seven stages of Embryological development which correspond with the seven Grand Types of animal life.

From these correspondences we may justly infer that every animal reproduces in its own individual development the forms passed through in its Race development. By the light of this truth we can construct the grand trunk of our tree, not, it is true, with forms which exactly resemble those that really did exist, but with *types* which must have existed if the theory of Evolution be the true explanation of the origin of life.

Whilst, therefore, we cannot affirm that any existing creatures are in all respects similar to any of man's ancestors, yet we can affirm that the Types upon which they are built are the same as those through which man's *line of descent passes.* As we descend the tree of life, man's blood relationship with the animal kingdom increases; and when the foot is reached we are to recognize in the Bioplasm from which it springs the common ancestor of both the animal and vegetable world.

It now remains to trace the development of the main stem of the vertebrate type up to its culminating point in man. This main trunk, being the line of man's descent, the individual forms composing it become his direct ancestors. Whilst it is now, and most likely ever will be, utterly impossible to give anything like a *correct* notion of what these creatures were like, yet we can acquire a

vague idea of their salient peculiarities by the light of Embryological development and the study of existing vertebrate forms.

Existing vertebrata are divisible into Five grand divisions, Fishes, Amphibia, Reptiles, Birds, and Mammals. There is every reason for thinking that the Bird form is not in the line of man's descent; hence it does not enter into the construction of this main stem. We have, therefore, but Four forms to study: the Fish, the Amphibian, the Reptilian, and the Mammalian.

This latter is divisible into Water and Land Mammals, and as there can be no doubt that man descended from the latter, our attention is confined to it alone.

Land Mammals are divisible into Cloacal,* Pouched,† and Placental.‡ There is good reason to believe that these forms succeeded one another in development; hence they all enter into the formation of the main stem.

Again, Placental Mammals are either Deciduate or Indeciduate. In the former case the Placenta is made up of an intimate union of the lining membrane of the womb with the membranes of the embryo; hence the Placenta is said to be Deciduate. In the Indeciduate there is no such intimate union between the tissues of the Mother and the tissues of the Offspring. Now, as man is a deciduate placental animal, it is obvious that he has descended from deciduate placental ancestors; hence the Deciduate placental form is another link in the chain.

Again, in the Deciduate placental animals, the attachment of the placenta to the uterine wall is either zone-like or disk-like. In man the placenta is shaped like a disk; hence the Disco-placental is another form in the main stem.

As man's line of descent must have been through some ape-like form, and as the apes are disco-placental, the next in the main stem becomes the Ape Form. From this we are led to the Old World ape, for it is generally conceded that man came into being in the Old World and most likely in Asia. From the Old World ape

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* So called because there is a spacious *cloaca* common to the rectum, genital and urinary organs.

† Pouched, or Marsupial, possessing a pouch in which the immature young are carried after birth.

‡ Those animals which possess a Placenta, or "after-birth."

we are led to the Asiatic man-like ape; from this to the ape-man, thence to man himself.

These various stages of man's descent through the Vertebral Type may thus be briefly outlined:

1. *The Fish-like Form.*—The description already given of the general conformation of the Vertebral Type will suffice, in part, to give the reader an idea of what this form must have resembled. When fully developed, this form must have possessed a vertebral column, separable into distinct vertebræ, in which is lodged the spinal chord. The anterior end has developed into a brain, protected by its casing. The digestive apparatus is well developed, and a liver, kidney, and swimming bladder exist. The breathing apparatus consists of branchial arches, through which the blood is propelled by a heart composed of *two* cavities. The creature is an inhabitant of the water and its movements are assisted by fin-like processes.

2. *The Amphibian-like Form.*—In the process of development of the Fish-like form, the swim-bladder is converted into a rudimentary lung, thereby enabling the creature to breathe air as well as water. The pectoral and anal fins become gradually developed into true limbs, armed with digits, which never exceed five in number. The short excursions on land which the animal makes increase the importance of the rudimentary lung, whilst the gills gradually diminish. The heart is gradually modified to suit the new condition of things and a third cavity becomes developed. The gradual disappearance of the gills is accompanied by further lung development, and the creature is transformed into the next form.

3. *The Reptilian-like Form.*—In general appearance this form must have at first closely resembled the preceding. But it differs from it in being purely an air-breather, the gill appendages having entirely disappeared. The heart, which originally consisted of but *Three* cavities, gradually develops another, and this change initiates the fourth step in development.

4. *The Cloacal Mammalian Form.*—The heart now consists of *Four* cavities, and generation is ovo-viviparous, that is to say, the egg, which in the preceding forms was hatched outside of the body, is retained and the embryo undergoes partial development in the body of the mother, though there is no placental connection be-

tween them. As the young is brought forth in an immature state, it requires nourishment, and the milk glands of the mother become developed to supply this want. Some of the members of this form acquire land habits, whilst others keep to the water; from the former are descended land mammals, and from the latter the various mammalian inhabitants of the sea; hence the next form in the main line becomes—

5. *Land Cloacal Mammals.*—The habit of seeking the land, acquired by some of the members of the preceding form, becomes confirmed. The organization of the animal is further modified to adapt itself to the new condition of things. As the young are brought forth in a very immature state, a *pouch* (probably similar to that which exists among existing Marsupials) is developed, in which the young are deposited immediately after birth and there retained until the offspring is more fully matured.* The development of such a pouch initiates the

6. *Marsupial Form.*—In this form a pouch is developed in the vicinity of the milk glands, and the immature young remain attached to the nipples until more mature. The internal organs of generation undergo further development, and the Marsupial form gradually passes into the

7th, or Placental Form.—In this form there is vascular connection between the mother and embryo by means of a placenta, and the period of uterine life is now extended until the embryo is fully matured.

Placental mammals are divisible into two classes: the *Deciduata*, in which the *entire* Placenta is thrown off at birth, and the Indeciduata, in which *only the foetal part* of the Placenta comes away at birth and the lining membrane of the womb remains intact; hence in the latter there is no loss of blood on the part of the parent.

In man the Placenta is Deciduate. We are, therefore, justified in asserting that he is a descendant of an animal whose Placenta was Deciduous. We may, therefore, reckon this as the next form in the line of descent.

8. *The Deciduate-Placental Mammalian Form.*—Examination

*Among some existing Marsupials, the offspring is retained in the uterus but a single month; it is then born and deposited in the pouch, where it remains attached to its mother's nipples until mature.

of all animals in which the Placenta is Deciduous shows that there are two ways in which the Placenta is developed. In Man, Apes, Rodents, &c., the Placenta is a disk-shaped body; hence the name Disco-placental applied to these. In the Carnivora, Proboscidea, &c., the Placenta is developed as a zone, or ring; hence the name Zono-placental. The Disco-placental, therefore, becomes the next form in the line.

9. *Disco-placental Form.*—From this form arose the Ape form, and all the lower disco-placental animals now existing. There can be no doubt that man descended from an ape form; hence this is to be regarded as the next stage of development.

10. *The Ape Form.*—Existing apes are divisible into the New World and the Old World Apes. None of the existing New World apes show development comparable to those of the Old World; hence the ground for assuming this form to be the next in the line.

11. *The Old World Ape.*—We know that this form gave rise to the African and Asiatic apes, from which were developed the man-like apes of both continents.

As it is generally conceded that man came into being some where on the continent of Asia, we are, therefore, justified in placing the Asiatic man-like ape next in order.

12. *The Asiatic Man-like Ape.*—From this form developed the ancestors of the present Orang and Gibbon, and the Ape-man.

13. *The Ape Man* we may regard as the direct ancestor of existing man, and, therefore, the last step in the upward course of development. It doubtless resembled existing savages very closely, the chief *apparent* distinction being the absence of language. Under the influence of those forces which we may distinguish as Soul Forces, the Brute-man developed rational speech, and MAN, the crown and glory of creation, came into existence.

It will be seen from the foregoing sketch of man's development that no living animal form can lay claim to the distinction of being man's direct progenitor. His animal ancestors have long since perished, and it is only in the light of analogy, and the truths of comparative anatomy, and the teachings of Embryology that we can acquire some vague notion of what they must have been. The wide gap between man and the apes is filled up by an hypothetical dumb-ape man, who is supposed to have had a common origin

with existing man-like apes. The gap which separates man from existing apes lies more in his mental endowments than in physical structure. Physically he belongs to the same family with the apes, but mentally he is as far above them as the stars are above the earth. It has been anatomically demonstrated that there are greater structural differences between the higher and lower apes than there are between the higher apes and man. The greatest structural differences are manifested in the conformation of the skull, and in the weight and shape of the brain. For a long time there were three organs in the human brain which were supposed to be absent in the brain of the apes, viz: the third lobe, the posterior cornu of the lateral ventrical, and the hippocampus minor. But the labors of Huxley have demonstrated beyond a doubt that these characteristics are found in the brain of the Chimpanzee, Orang, Gibbon, and in all the genera of the Old World baboons and monkeys, and most of the New World forms.

The bitter contest which raged between the two great English Biologists, Owen and Huxley, is still fresh in the minds of men, but that Huxley established his position with reference to this question is now universally recognized.

The truth is that these points are found to be, in many cases, more largely developed in the ape than in man himself. "As to the convolutions, the brains of the apes exhibit every stage of progress from the almost smooth brain of the Marmoset to the Orang and the Chimpanzee, which fall but little below man. And it is most remarkable that, as soon as all the principal sulci appear, the pattern according to which they are arranged is identical with that of the corresponding sulci of man. It is only in minor characters, such as the greater excavation of the anterior lobes, the presence of fissures usually absent in man, and the different disposition and proportions of some convolutions that the Chimpanzee's or the Orang's brain can be structurally distinguished from man's."—(Huxley.)

But while there are few *tangible structural* differences, differences that can be appreciated by the naked eye or even by the microscope, yet there must be very wide distinctions in minute structure which no means at our command can enable us to determine. The chief *apparent* difference in the brain of man and that of the higher apes is clearly seen in its development as a whole, its size and weight. And this is all the more remarkable when we consider

that the body of a well-developed gorilla is about twice as heavy as an average man, whilst the weight of an average human brain is more than twice as heavy as the brain of a gorilla. But even this wide difference in the degree of brain development is not sufficient, in the opinion of the writer at least, to account for the immense gap which exists between the intellectual power of the lowest man and that of the highest ape. Man, as an animal, must be classed with the apes; man, as an intellectual entity, must be numbered with the Immortals. There is something in man which tells him to *look up*, and teaches him that he is set apart for higher things, that a nobler destiny awaits him.

To this *Something* the name of Soul has been given, and man's essential nature lies therein. Those philosophical systems which make man's intellectual part depend entirely upon the action of brain molecules deny by implication the existence of an independent immaterial thing called Soul. With them intellect is merely a phenomenon of the action of material atoms. Sad to relate, many of the most widely-known names of modern science have committed themselves to this line of belief and are its greatest champions.

We have attempted to trace the line of development pursued by the first form of life until we see it culminating in man as the topmost branch of this wonderful tree of animated creation. These various stages may be briefly summarized:

1. Zoöplastic.
2. Cellular.
3. Membranous.
4. Hollow or Cœlenterata.
5. Massive or Molluscus.
6. Elongated or Annulose.
7. Fish-like or Vertebral.
8. Amphibian-like.
9. Reptilian-like.
10. Cloacal Mammalian-like.
11. Land Cloacal—Mammalian-like.
12. Marsupial-like.
13. Placental Mammalian-like.
14. Deciduate Placental Mammalian-like.
15. Disco-placental Mammalian-like.

16. Ape-like.
17. The Old World Ape.
18. Asiatic Man-like Ape.
19. Ape-Man.
20. MAN.

The theory of Evolution asserts that, were it possible to pass in review all the individual generations which enter into the formation of the main trunk of the tree of Life, the transition from one to the other would be so insensible that it would be impossible to distinguish any two contiguous generations. It is obvious, therefore, that the absolute number of stages through which man has passed correspond to the *number of generations* which have appeared on the earth since life came into being. The nineteen stages above laid down are merely so many typical forms, so many equi-distant points marked off on the trunk of the tree of life, and the gaps between must be filled by innumerable transition generations.

The reconstruction of the various branches of the tree of life is now the great goal of the sciences of Zoology and Botany. The records of Geology have already done much in this direction, and much more may be anticipated. But anything like an accurate and complete rehabilitation will forever remain, in the very nature of things, unattainable.

The accompanying chart lays no claim to be considered even an attempt, and is only introduced to bring before the mind of the general reader an idea of how the diverse forms of life might have originated from a common source. He is requested to use his imagination a little and clothe the branches with foliage, which will represent existing life on the globe.

He who can contemplate the majestic tree of animated nature and deny the existence of an *innate tendency* on the part of the first germ of life to develop as it has done, may, with equal justice, deny to the acorn the potential power of bringing forth the oak. In both, external conditions are essential to the full development of the germ. An acorn planted in a mere sand-heap could never bring forth the sturdy oak, neither would the germs of life have developed had it not been for favoring conditions. But it is also obvious that were it not for the internal *tendency* the acorn would be powerless to produce the oak, even though it were planted in the richest soil. How it is that so many modern thinkers

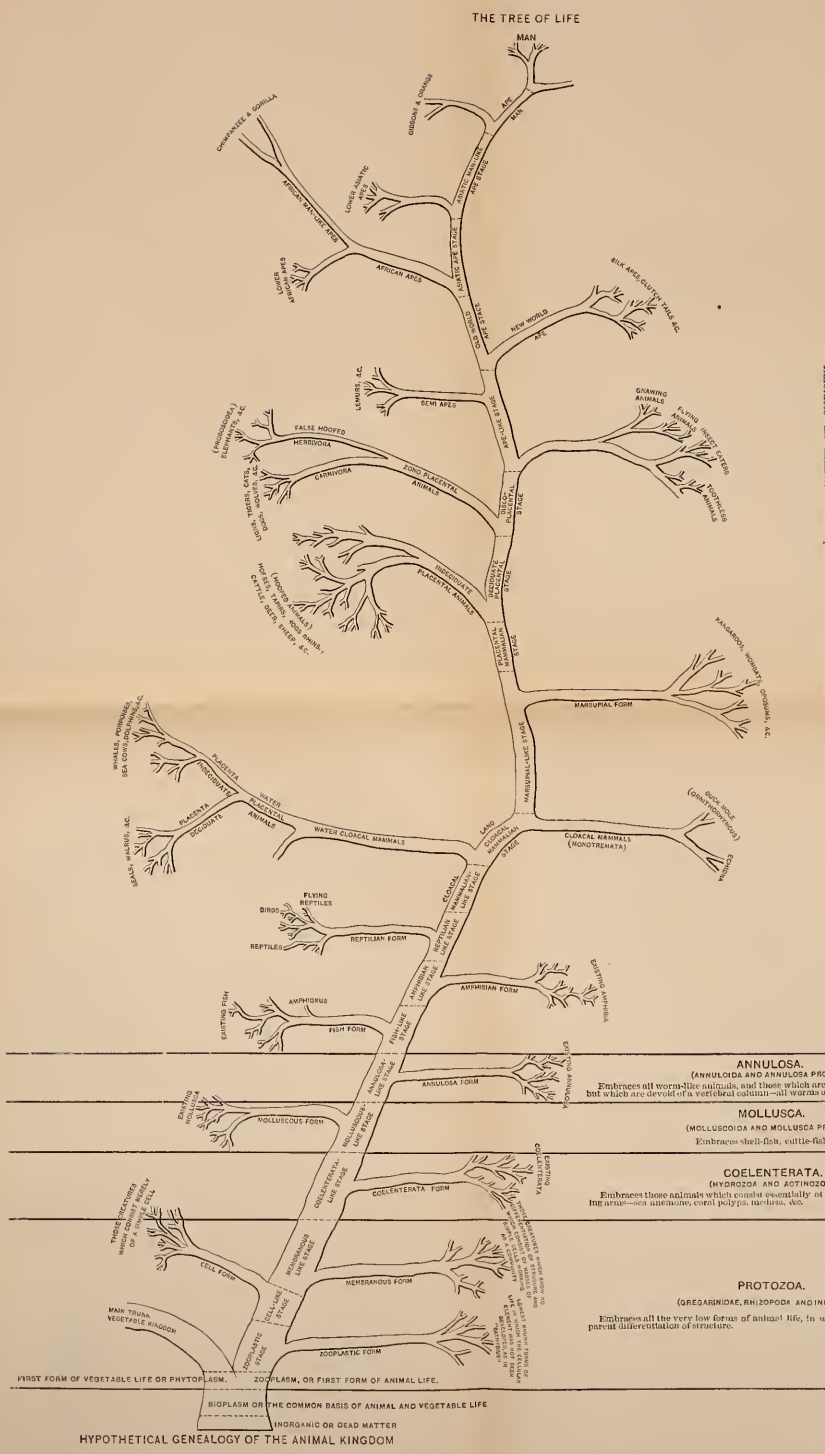
have closed their eyes to this great truth is an inexplicable mystery.

Mr. Spencer, in criticising Dr. Owen for holding "*the axiom of the continuous operation of creative power, or of the ordained becoming of living things*," says: "In whatever way it is formulated, or by whatever language it is obscured, this ascription of organic evolution to some aptitude naturally possessed by organisms or miraculously imposed on them is unphilosophical. It is one of those explanations which explains nothing—a shaping of ignorance into the semblance of knowledge. The cause assigned is not a true cause—not a cause assimilable to known causes—not a cause that can be anywhere shown to produce analogous effects. * * * In brief, this assumption of a persistent formative power, inherent in organisms and making them unfold into higher forms, is an assumption no more tenable than the assumption of special creations."*

This criticism, passed upon the most illustrious of living zoologists, is certainly very severe. But will Mr. Spencer explain how it is that of two eggs subjected to exactly the same *external conditions* one will bring forth a chicken, the other a duck? Mr. Spencer would be the last one to accept the old theory of "Preformation," referred to in the first chapter; how, then, would he explain the production of these very different creatures from masses of protoplasm which are apparently so nearly alike? For so nearly alike are they that no zoologist would pretend to discriminate between the primitive eggs of either. Obviously, Mr. Spencer is compelled to acknowledge that the differences between the two reside in the "*innate tendencies*" peculiar to each. The process asserted by the doctrine of *True* Evolution, and so well expressed by the axiom of Dr. Owen, finds its analogy in every seed and egg throughout the wide field of nature. It is a process which is entirely "assimilable to other processes," Mr. Spencer to the contrary notwithstanding.

The doctrine of True Evolution, then, asserts that the first germs of Life, or the Biogenetic egg, possessed an innate tendency to bring forth the tree of Life with all its innumerable and wide-spreading branches; it recognizes the necessity for favoring con-

* Principles of Biology, page 404.



HYPOTHETICAL GENEALOGY OF THE ANIMAL KINGDOM

VERTEBRATA.

PISCES.
AMPHIBIA.
REPTILIA.
AVES.
MAMMALIA.

Embraces all animals which possess a vertebral column.

ANNULOSA.

(ANNULOIDA AND ANNULOSA PROPER.)

Embraces all worm-like animals, and those which are made up of articulated pieces, but which are devoid of a vertebral column—all worms and insects, crabs, lobsters, &c.

MOLLUSCA.

(MOLLUSCOIDA AND MOLLUSCA PROPER.)

Embraces shell-fish, cuttle-fish, &c.

COELENTERATA.

(HYDROZOA AND ACTINOZOA.)

Embraces those animals which consist essentially of a stomach cavity, and radiating arms—sea anemone, coral polyps, medusa, &c.

PROTOZOA.

(GREGARINIDAE, RHIZOPODA AND INFUSORIA.)

Embraces all the very low forms of animal life, in which there is little or no apparent differentiation of structure.

ditions, without which these innate tendencies could not have made themselves manifest; and it also recognizes an innate tendency on the part of the globe to fit itself for the reception of higher and higher life. But, above all, it recognizes the existence of an Omnipotent Causative Power, who, in the beginning, created the atoms, and impressed upon them the laws which have insured the production of what we see around us; and in the material Universe, with its multitudinous phases, we are to behold these primal laws unfolded for our contemplation. The material Universe is but the mirror which reflects the Infinite Ideal.

CHAPTER VIII.

PSYCHOGENESIS OR THE EVOLUTION OF THE SOUL.

"There is a natural body and there is a spiritual body.

Howbeit that is not first which is spiritual, but that which is natural; then that which is spiritual.

The first man is of the earth, earthy; the second man is of heaven."—*St. Paul.*

In the preceding chapter, we considered man, the animal, composed of a mass of bones, muscles, blood-vessels, and nerves. In the present chapter, we are called upon to contemplate man, the Immortal Soul, endowed with the consciousness of Right and Wrong, and destined to a never-ending existence. Before proceeding with the discussion concerning the origin and nature of the Soul, it will be well, in order to prevent possible misunderstanding, to call the reader's special attention to the argument set forth in the second chapter as to the nature of Evolution in general. The formula there given to embody the doctrine of Evolution is a genuine scientific deduction from the field of experience. That formula reads thus: *Evolution is a change from the complex to the simple—a progressive unfolding of cause into effect.*

It was shown that this formula, arrived at by the observation of nature, was also a necessary outcome of our conception of a Primal Being upon whom all things depended, and that this proximate or Scientific definition of necessity merged itself into the ultimate or Transcendental definition, that Evolution in its totality is the continuous unfolding of the WILL of the great First Cause.

And here let me caution the reader not to confound the ESSENCE of this First Cause with the WILL power which it manifests in the phenomenal Universe, as was done by all the pantheistic systems of earlier times and as is done by the Spencerian philosophy of to-day.

It was also shown in the same chapter that the ultimate nature of the Divine Essence, not being comprehensible by a created intelligence, could not be a subject of study properly so called, but

only of devout contemplation, and that the manifestation of His Will in the phenomenal Universe was the only domain open to investigation.

Now, the Great First Cause or Divine Essence has manifested His Will in the Universe in different ways, that is to say, human consciousness is affected in different ways by it.

That embodiment of His Will which affects us as *occupying* SPACE we designate MATERIAL. That embodiment of His Will which does *not* affect us as occupying space is termed the IMMATERIAL.*

Under the head of the Material, the ATOMS only are embraced; under the Immaterial are included all those other expressions of the Divine Will which are cognizable by the understanding. These various Immaterial embodiments of His Will have received different names, according to the sphere of their activity. Those at work in what is called the Inorganic world, bringing about the various phenomena which it presents, are designated Physical or Material Forces; those which compel the atoms to aggregate into masses which manifest the phenomena of Vitality are called Vital Forces; those which induce still higher atomic aggregation may be called Instinct Forces; and finally, those that compel the atoms to assume the highest relations known to us, to which the name of Intellectual Forces or SOUL has been given.

FORCE, therefore, whatever be the sphere of its activity, or whatever the phenomena to which it gives rise, can only be defined as the Immaterial Expression of the Divine Will. The atoms may be regarded as the Passive Expressions of Will, whilst the Laws or Forces governing them are the Active Expressions of the same Will. Thus, whilst mere science teaches us the Permanence of Force and the Indestructibility of Matter, philosophy teaches us that these, being but expressions of Divine Will, become *extinguished* by the *withdrawal* of the will of which they are the embodiments.

The visible Universe, then, presents us with a blending of these two different modes of will manifestation on the part of the Deity, and the action of the one upon the other occasions all the phenomena. It is obvious that the will power expressed by the

* The act of Creation can only be defined as the *expression* or unfolding of the Will of the First Cause.

Passive atoms serve only as a basis for the working of the Immaterial Expressions, called Laws or Forces, to which human ingenuity has given different names, according to the character of the phenomena presented. The *visible* Universe, therefore, as we conceive of it, is Immaterial in its nature, the atoms merely filling up the form thereof, manifesting thereby to our cognition the existence of the governing Forces.*

When, in the course of untold ages, the atoms of matter under the supervision of the laws or forces set over them by Omnipotence had arranged themselves into certain aggregations, then the Principle of Life became manifested or Evolved. Through the continuous working of these laws, the atoms were compelled to assume higher and higher combinations, through which higher and higher Life manifested its existence until the highest aggregation of all was reached.

We saw, in chapter IV, how the inorganic world gradually prepared itself for the reception of life, and when the fitting time came life appeared. We also saw how the Earth continued to fit itself for the abode of higher and higher forms of existence.

Just as the inorganic matter of the globe fitted itself, through the influence of preëxisting Vital Forces, for the manifestation of the phenomena of Vitality, so animal life, in its gradual ascent to higher forms, was being prepared for the manifestation of that infinitely higher form of existence called the human SOUL.

When, in the fulness of time, the animal brain, under the influence of these Soul forces, had been carried to that degree of development which enabled it to manifest this new and more exalted life, the Principle of the Soul may be said to have taken up its abode upon the Earth and its animal possessor assumed his station at the head of animated nature, inaugurating a new era in the history of terrestrial creation.

The opponents of the doctrine of Evolution may argue that the Soul being essentially different in its nature from the intelligent or instinct principle which even the most exalted brutes exhibit, man, therefore, could not have been evolved from them. The

* Berkeley had a keener insight into the nature of things than any man since his time. The most absurd interpretations have been placed upon his views by those who failed to penetrate the depth of his reasoning. Though Berkeley had no use for *atoms*, he never denied the *existence* of *visible things*.

difference being not only one of degree but also of kind, how could the one bring forth the other? How can anything produce something wholly different from itself? These objections lose all weight when the true nature of Evolution is kept in view. For, as already so frequently insisted upon, Evolution is and can be nothing more than the continuous unfolding of the will of the Great First Cause. *The process, therefore, only becomes possible when there are superimposed laws to be made manifest.*

In discussing the origin of life, we saw that the principle of Vitality resided not in the molecules of Carbon, Oxygen, Hydrogen, and Nitrogen, of which the Bioplasm was composed, but in the laws or forces governing them. So the principle of intelligence in animals, known by the name of instinct, and the still loftier principle of the Soul in man, reside, not in the atoms of which the brain is composed, but in the Immaterial laws which have compelled these atoms to assume the relations which enable them to manifest these principles.

When the animal had attained to its full development merely as an animal, new laws, Soul laws, came into operation and forced the atoms into still higher aggregations, thus enabling them to manifest this new Principle. It is obvious that this is no less a creative act on the part of the Deity than if He had molded man's material frame *immediately* from inorganic matter and breathed into it *directly* the Principle of the Soul. It is therefore apparent that the objections urged against the origin of the Soul through an evolving process have no foundation in reason, and arise from a misapprehension of the *true* nature of Evolution, which is nothing more than a continual unfolding of the Divine Will.

Mr. Darwin well says, (Descent of Man, Vol. II, page 378:) "Few persons feel any anxiety from the impossibility of determining at what *precise* period in the development of the individual from the first trace of the minute germinal vesicle to the child either before or after birth man becomes an immortal being, and there is no greater cause for anxiety because the period in the gradually-ascending organic scale cannot possibly be determined."*

* This was written before Mr. Darwin had assumed the avowedly atheistical attitude which he subsequently fell into.

The doctrine, as enunciated by Mr. Spencer and his coterie, does indeed offer insuperable obstacles. But, as already sufficiently shown, his philosophy is one of Involution and not of Evolution. His system does not recognize an Intelligent Great First Cause, the author and sustainer of the Universe; hence, according to his theories, the moral or Soul principle in man is essentially the same as the Instinct principle manifested by the lower creation, and is doomed like it to be dissipated when the matter of which the material frame-work is composed resolves itself into its constituent elements. It is not surprising that his system should arouse the antagonism of every mind that entertains a hope of a future life. But the origin of the Soul as expounded by the doctrine of *true* Evolution presents no such obstacles to the mind, and it, furthermore, elevates our conception of Infinite Wisdom and Power.

In chapter II, when the relative merits of Evolution and Special Creation were under consideration, it was shown that there is nothing in Genesis, when taken *literally* and *without interpretation*, which throws any light upon the methods of the creative process; the bare statements of creation only are made. But, when we bring to our assistance in the elucidation of this account the teachings of modern science, and give another meaning to certain words which *will bear a different interpretation in the original*, it is a remarkable fact that a picture will be presented such as the most advanced modern scientists have painted. It is to be remembered that this description of creation was written for the *instruction* of man in all the stages of his intellectual growth. At the time of its deliverance the mass of the people was buried in ignorance, and practiced superstitious rites to innumerable gods. They had not yet risen to the conception of ONE Supreme, non-material BEING, the author of all other being, but "bowed down to wood and stone." It was obviously the intent of the writer of Genesis to draw the mind away from the contemplation of the material world and lift it to the conception of a BEING, not the world, but the author of it. But, as it was written not only for the edification of the people of that early period but for man at every stage of intellectual progress, the description of creation was so couched as to *reflect the truth for all men and for all time.* To early man it taught the great truth that the world is not Uncaused and Eternal, but

that it was created by a Being very different from it in nature. To man of this nineteenth century, whose mind has been enlightened by the discoveries of science, it further teaches that the creative process has been continuous and gradual.

Though we are not to look upon Genesis as an attempt on the part of its author to draw a minutely accurate scientific picture, yet science is far from being wholly ignored, and the general outlines given of the creative process, when properly interpreted, will stand the severest scrutiny of modern scientific thought. Before attempting to follow the interpretation, the general reader is earnestly requested to re-peruse the third chapter, in which an outline sketch of the nebular hypothesis is given. In the following running commentary, the original is placed in one column and in a parallel column the account is interpreted. The reader will thus have no difficulty in comparing the two.*

ORIGINAL.	AS INTERPRETED.
1. In the beginning God created the heaven and the earth.	Literal.

This first verse is to be regarded as a preamble to the whole chapter—the enunciation of the comprehensive fact of creation in general, and in which is embraced, by implication, the creation of the matter which forms the basis for the Material Universe.

2. And the earth was without form, and void; and darkness was upon the face of the deep; and the spirit of God moved upon the face of the waters.	2. And the earth was without form, (that is, *had not assumed form,*) and (*therefore*) void, (i. e., *non-existent*;) and darkness was upon the face of the deep, (i. e., on the boundless expanse of space;) and the spirit of God moved upon the face of the *Gases*, (or Fluids.)

*This interpretation of the first chapter of Genesis differs from that of Guyot in one very essential point. He thinks that the word "Earth," in the second verse, should be interpreted as referring to matter in general. In other particulars the interpretations agree. These pages were written before Guyot's work entitled "Creation" had been published, and before the author was aware that he held such views regarding the Biblical account.

This verse is to be looked upon as a picture of primeval space with its formless mass of diffused matter. It asserts that the material of which the Earth is composed was *without form*, that is to say, the Earth itself, as yet, did not exist; it is therefore referred to as being "*void.*" This is the only true interpretation to be placed upon the word "*void.*" It is not used in the sense of an existing thing being *empty* of *something*, but is meant to convey the idea of the non-existence of the Earth itself. This interpretation floods the whole verse with light, and renders unnecessary the strained explanation of Guyot, who thought the word *Earth* should be translated *Matter in General.* The word "*Erets*" (the Earth) does refer to our Globe, but it refers to it as *non-existing;* thus the whole difficulty is cleared up.

The word *Maïm*, which has been translated "*Waters,*" may, on the authority of the first Hebrew scholars, be interpreted "*Gases*" or "*Fluids.*"

The spirit of God moving upon, or brooding over, the face of the Gases, beautifully expresses the creation of the law of Universal Gravitation, which now came into being, and under whose influence the creative act of the next verse was to be made manifest.

3. And God said, let there be light; and there was light.

3. Literal.

This verse announces the fact that light appeared in obedience to command. Had the writer attempted to explain that light was the result of the heat caused by the rushing together of the atoms in obedience to the law of Universal Gravitation which Omnipotence had impressed upon them, the untutored minds of the people would not have had the slightest conception of what he meant to convey. It is, therefore, not surprising that he should name as the *first* act of Creation the appearance of light. This would impress their minds more fully with the magnitude of the Creator's Power.

4. And God saw the light, that it was good; and God divided the light from the darkness.

4. Literal.

Here we have a simple statement of the fact that the light dispelled the darkness from that part of space which was the seat of Creative Power.

5. And God called the light day, and the darkness he called night, and the evening and the morning were the first day.	5. And God called the light day, and the darkness he called night, and the *beginning* and the *ending* were the *first Period.*

The words *day* and *night*, even in this matter-of-fact age, are often used as synonyms for *light* and *darkness.* Moses used the words in this sense, without the slighest reference to the sun, which had not yet been created. The words "morning," "evening," and "day," are to be interpreted "beginning," "ending," and "*Period.*" Thus we often speak of the morning and evening of life, meaning thereby the beginning and ending of life. In the verse the metaphor is carried out, and the indefinite duration which must have elapsed is therefore spoken of as a day.

With the fifth verse the first period of Creation or Evolution ends. It embraces a description of the primitive void; the creation of the atoms of matter; the creation of the law of Universal Gravitation, and the flowing together of the atoms as a result of this law; the production of light, induced by the intense heat evolved by the attrition of the atoms. The Universe was a whirling mass of flaming matter.

And now we come to the Second period of Creation—the Evolution of the individual worlds from this heated fluid mass.

6. And God said, let there be a firmament in the midst of the *waters*, and let it divide the *waters* from the *waters.*	6. And God said, let there be a firmament in the midst of the *Fluids*, and let it divide the *Fluids* from the *Fluids.*

Here commences the evolving process of world formation. We have seen that space was filled with a fluid mass, the word "*Waters*" should, therefore, be interpreted "*fluids.*" The creation of the firmament (the word signifies a "bounding space or expanse") refers to the vacant places left by the withdrawal of the matter from those spaces, and its centralization under the influence of various centers of attraction. These numerous centers of attractive energy are produced by the throwing off of smaller masses from the revolving whole. These, in their turn, throw off smaller masses, and these still smaller, and so the process of world formation continues.

7. And God made the firmament and divided the *waters* which were under the firmament from the waters which were above the firmament; and it was so.	7. And God made the firmament and divided the *fluids* which were under the firmament from the *fluids* which were above the firmament; and it was so.
8. And God called the firmament Heaven, and the *evening* and the *morning* were the second *day.*	8. And God called the firmament Heaven, and the *beginning* and the *ending* were the second *period.*

In these two verses we have a recognition of the fact that the command of the sixth verse had been obeyed; that order had come out of chaos, and that innumerable worlds, each revolving around a center, beautified space and added its rythmic pulsations to the tuneful choir of the spheres.

With the production of this universal order the Second day or period of Creation is very appropriately said to end.

9. And God said, Let the waters under the heaven be gathered together unto one place; and let the dry land appear; and it was so.

10. And God called the dry land Earth; and the gathering together of the waters called He Seas; and God saw that it was good.

11. And God said, Let the Earth bring forth grass, and the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the Earth; and it was so.

12. And the Earth brought forth grass and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind; and God saw that it was good.

13. And the evening and the morning were the third day.

This *third* day embraces the development of the Earth from its primitive molten character, as thrown from the sun, to the first appearance of Life upon its surface. The ninth and tenth verses describe the period during which the globe was preparing itself for the reception of Life. The word "Waters" is here used in its ordinary significance.

In the eleventh and twelfth verses this life is described as being vegetable in its nature, and no reference is made to animal life of any kind.

Now vegetation, in the minds of the ignorant, even to this day, is associated with land. Had Moses, therefore, attempted to explain that the *first* forms of both vegetable and animal life were produced from the waters, it would have confused their minds, and obscured the picture which he wished them to contemplate. The low vegetable and animal forms which first appeared in the waters were not such as they were familiar with, and, therefore, no lesson could be drawn from them with which to impress their minds. He, consequently, in his description of the development of life on the Globe, entirely ignores the very low forms of the vegetable and animal kingdoms, and confines himself to that part of the animated creation with which his people were familiar, that is to say, with High life in all its Grand divisions of Vegetable, Marine, and Land animal life. Now such a division as this does represent an ascending scale of development; for vegetable life is lower than animal life, and, in the animal kingdom, marine life is much lower, with the exception of the Marine Mammalia, than the birds of the air, and birds are lower than the higher land animals. Had Moses told them that both animal and vegetable life were created at this time, and that they were both of Marine origin, his audience would have at once supposed that the plants and animals they saw around them were referred to, and this notion could only have been dispelled by giving each a microscope and a basin of water containing a number of specimens from the lowest representatives of both kingdoms. Again, had he told them that many of the higher marine forms, as the whale and porpoise, belonged to the same class as the higher land animals, he would have still further confused their minds, and his only escape out of the difficulty would have been a scientific lecture on comparative anatomy. How such an exposition would have been received by the descendants of Abraham, Isaac, and Jacob, the reader is left to determine. It is, therefore, evident that Moses acted more wisely than many of his critics would have done under similar circumstances. Commencing at the lowest end of the scale of created beings, he avoids confusing their minds by describing each grand division as monopolizing an entire period of creation.

From the fourteenth to the nineteenth verse, inclusive, is embraced the fourth day of Creation or period of Evolution.

In the fourteenth verse we see reference made, for the first time,

to the celestial bodies, and the office of these in regulating the seasons, days (day in its true sense) and years. Here we have a recognition of the fact that the dense mass of aqueous vapor, which had previously enveloped the Earth, was breaking up and precipitating itself upon the surface of the Earth as rain. thus permitting the Sun, Moon, and Stars to shed their rays upon the Earth. They are thus said to have been created at this time, and, with reference to the Earth, such was the fact.

The sixteenth verse is a reiteration and special recognition of the office of the Sun and Moon. Reference is also made to the stars in recognition of their light-giving power, though these also had been previously created. This fourth day, therefore, involves no creative act at all, for the sun, moon, and stars had been developed during the second period, but, in relation to the Earth, they now begin to make their influence felt more conspicuously, and are therefore said to have come into being at this time.

From the twentieth to the twenty-third verse, inclusive, is embraced the fifth day of creation.

Following out the plan adopted in describing the third day of creation, Moses here refers to the creation of marine animal life as a whole. He does not stop to explain that whales, sea-cows, porpoises, and other Marine Mammalia, belonged to a much higher order in the animal kingdom than the great mass of the inhabitants of the waters, and that they did not come into existence until a much later period. The Hebrew word which has been translated "whales" is literally rendered "stretched-out-sea-monsters," which is a very good description of the huge lizards of early geologic time. The Fowls of the air are next spoken of as having been created, and with their creation the fifth day is said to end.

The sixth day of creation deals with the higher animals, and Man, the crown and summit of terrestrial things, was created in the image of his Maker.

Thus, whilst a scientific exposition does not permit the setting apart of a whole period for the full development of each of the grand divisions of animated nature, yet we can appreciate the great truth that the method Moses adopted to impress the minds of the people was the only one open to him, and that a more accurate description would have defeated its own ends.

To sum up, Genesis and Modern Science agree in teaching—

First. That in the beginning the immeasurable expanse of unbounded space was one vast vacuum, and that darkness rested upon its bosom.

Second. That the atoms of matter are not self-existent, (uncaused,) but were created.

Third. That these atoms were impressed by a law (universal gravitation) which caused them to rush toward one another, and that the resulting friction caused the evolution of heat and light.

Fourth. That the accumulation of matter at various points, under the influence of this attractive energy, left vacant certain portions of space, and thus the *firmament* came into being.

Fifth. That the globe on which we dwell was prepared for the reception of higher and higher life by the gradual elevation of the land above the waters.

Sixth. That the vegetable kingdom is lower in the scale of being than the animal kingdom, and that its humbler representatives preceded animal life on the globe.

Seventh. That an aqueous atmosphere of great thickness enveloped the Earth, and that its dissipation allowed the sun, moon, and stars to shed their full radiance upon the globe.

Eighth. That marine animal life, when taken in mass, is lower in the scale of organization than land life, and that it came into being before land animal life.

Ninth. That the fowls of the air hold an intermediate place between the great stretched-out sea monsters and the beasts (mammalia) of the field which were to come after.

Tenth. That these beasts of the field were the last of the lower creation to come into being.

Eleventh. That man, though an animal in body, is endowed with a nature which takes him beyond the sphere of the material, and may, therefore, be said to image forth his non-material Creator.

That the narrative of man's residence in the Garden, and the story of his temptation and fall, are to be looked upon as allegorical is no longer denied by theologians. Reference to the *tree* of the knowledge of *good* and *evil* and to the *tree* of *life* compels us to regard the whole as an allegory; and, unless we are willing to believe that moral and abstract truths may be of vegetable growth, we must avoid a literal interpretation which does violence alike

to our intellect and the sublime truths which the allegory is intended to convey.

This great allegory, whatever else it may teach, carries with it a distinct enunciation of a truth which lies at the very foundation of all true religion. It asserts in unmistakable language the FREEDOM of the human will by recognizing the possibility of man's Disobedience; and it furthermore unfolds to us the essential nature of SIN, by showing that disobedience and sin are one and the same. Thus, at the very threshold of religion, we are introduced to the two cardinal truths upon which this religion must rest. We are to regard ourselves as endowed with Freedom—free to obey or disobey.* Sin or moral evil can, therefore, exist only in a Free Agent; destroy this freedom of action, and sin is destroyed; allow freedom, and you recognize the possibility of disobedience, that is, of sin. And thus we are taught to look upon sin not as an Entity or Principle entering into the Constitution of the Universe, but as a CONDITION—a condition of rebellion flowing from freedom of action. How a creature can be endowed with freedom transcends our comprehension; but we *know* that moral responsibility cannot exist without freedom. An automaton cannot be made responsible for its acts, for such acts are not the outcome of its own independent volition, but the will of another working through it.

The grand mystery of our being lies here; a mystery, the comprehension of which transcending reason is still confirmed by consciousness. This conscious ability to do or not to do, to act or to refrain from acting, is as much a part of man's make-up as the consciousness of self-existence, and *no* man ever questioned it until taught to do so by fallacious reasoning. As well might one attempt to reason himself out of existence as to deny freedom of Will. The Moral Evil or Sin above referred to is a very different thing from that other kind of evil, called Physical Evil, which consists in pain, suffering, and death. These occur in the established order of nature, and are not to be regarded as things which *ought not to be.* In a word, they are not evils, if we define evil as something which should not exist.

* It goes without saying that man cannot be free in the *Same Sense* that the Creator is free. Man's freedom is *endowed* or dependent; that of the Creator is *unendowed.*

Why physical suffering and death should enter into the constitution of the world we cannot comprehend; but their Rightness no one can question who believes in the existence of a Supreme Beneficence. Suffering and death are often referred to in the writings of the Apostles as following upon the commission of Sin; but we are not to understand that physical pain and death are here meant, but moral pain and death. But these questions will be further considered in another chapter.

The allegory of the Garden comes to us, then, freighted with the most important revelations. It asserts the great truth of Man's Freedom, upon which all religion must rest, and it teaches us to recognize in Disobedience the true nature of Sin.

So long as men insist upon a literal interpretation of the Scriptures, and think it impious to bring to its study the critical eye of reason armed with all the revelations of science, so long will superstition envelope in its somber folds the radiant form of religion, cutting off and absorbing its life-giving heat and light.

True religion and *true* science can never be in conflict; both are the offspring of the same Great Cause, and, when rightly interpreted, serve but to elucidate one another and to bring out the truths of each in bolder relief. This thought is so beautifully and eloquently expressed by an eminent clergyman,* in a little book recently published, that the writer cannot do better than to quote the whole passage:

"The strictest orthodoxy now holds what was damnable heresy ten centuries or one century ago. The Universe was not created in six solar days; the sun was not specially lighted up to illuminate the earth; the planets are worlds and the stars are suns. Men have burned for suggesting such things. Yet who doubts them now, or what violence has been done to God's Word or its inspiration? We read these truths clearly in Genesis. And shall no more such opinions be given up as those which these truths have displaced? Shall a man be a heretic because he denies that there were Iguanodons or seven Pterodactyles in the ark? Have we reaped the full harvest of knowledge which lay potentially in that seed of physical science which God sowed by the hand of Moses? No; nor shall we through all the cycles of eternity, for even glorified human intellect must be finite, and the harvest from

* "The Sower," by the Rev. Robert Wilson.

the seed of Divine truth must be infinite. That truth, being God's truth, fears no other truth and antagonizes none, for all truth is of God and shares alike the life of the Holy Ghost. Let true science demonstrate—mark that word, *demonstrate*—what it may and it will tear down some false interpretation of Holy Scripture to show its new discovery gleaming in the mine where God placed it when Genesis became a sacred book." The opinions here so felicitously expressed are now entertained by the most pious and most profound theologians of the day. The champions of religion have too often assumed an antagonistic attitude toward science, looking upon its discoveries with fear or aversion, and utterly ignoring its teachings. If the physical Universe were the handiwork of a Demon they could not treat it with greater contempt. To such minds the world is the embodiment of all evil, a fitting abode for the powers of darkness, who range up and down in its fair fields, blighting and destroying. They are either unmindful or ignorant of the great truth, so clearly indicated in Genesis, that Sin as a Principle in the Universe can have *no* existence, that it is merely a condition of rebellion, the *possibility* of which becomes a necessity of Freedom. Was the Devil *forced* to raise the standard of revolt? If so, then the Devil is not responsible, and is, of all creatures, the most to be pitied.

But in accepting the revelations of the material world, it behooves us to discriminate well between true and false science. Science is unified knowledge, the discovery of the relations which bind together into an harmonious whole the detached facts of nature. Much that passes current for science has no good claim to that dignified title, being nothing more than the wild speculations of unbalanced minds. It is marvelous what some people will accept under the name of science, yet the same individuals laugh in derision at revealed religion.

The false systems of thought which flood the world are the result of the false interpretations placed upon the truths of nature.

The materials out of which Mr. Spencer, with such labor, has built his proud structure are taken from nature's quarries, and each stone bears the seal of its great maker, but the architecture and cement are from the hand of man alone, and the whole edifice is faulty "from turret to foundation stone."

I cannot bring this chapter to a close without touching upon a

subject than which none greater can occupy the mind of a rational being—that of the Soul's immortality.

The doctrine of the Immortality of the Soul comes to us from out the dim shadows of the past, and is clearly indicated in the Old Testament writings. This longing for a future life is certainly one of the noblest features of the human mind, and no age nor people seems to have been entirely devoid of some notion of a life after death.

Among the Hindoos, the doctrine of a future state assumed the form of metempsychosis or transmigration, and this translation from material tenement to material tenement was the fate of the soul until it reached its highest state of development, when it attained to NIRVANA and became absorbed into the Divine Essence of Brahm.

In the teachings of Prince Siddhartha, the founder of Buddhism, the doctrine of transmigration plays a most important part. By the purity of his life and the high spiritual elevation which he thereby attained, Siddhartha became a Buddh, (*i. e.*, the wise or enlightened,) and it was given him to know the various lives through which he had passed and also to realize the great truth that his material pilgrimages were at an end—that he had reached that degree of spiritual development which enables the soul to exist without being united to material substance, thereby fitting him to enter into Nirvana and become absorbed into the Divine Essence.

Mr. Edwin Arnold has beautifully translated the triumphant cry of Siddhartha when he had attained to his greatest enlightenment:

> Many a house of life
> Hath held me—seeking ever Him who wrought
> These prisons of the senses, sorrow fraught;
> Sore was my ceaseless strife!
>
> But now,
> Thou builder of this tabernacle—Thou!
> I know Thee! Never shalt Thou build again
> These walls of pain,
> Nor raise the roof-tree of deceit, nor lay
> Fresh rafters on the clay;
> Broken thy house is, and the ridge-pole split!
> Delusion fashion'd it!
> Safe pass I thence—deliverance to obtain.

The purity of his life gained him many disciples, and before his death the influence of his teachings was felt through the length and breadth of India. He did not claim to be more than what all other men might become, a Buddh, but the love and gratitude of Asia elevated him into an object of worship.

The doctrine of transmigration and immortal destiny of the soul was known to the early Greeks, who received it from the East.

But it was not until the days of Socrates and his disciple Plato, that the doctrine of the immateriality and immortality of the soul received the proudest vindication ever furnished by the uninspired intellect of man. They anticipated all the arguments that have been advanced since their time, and their clarified vision enabled them to penetrate deeper into the mystery of things than any uninspired writer who has ever lived.

With the advent of Christ, a new era broke upon the world, and the doctrine of the soul's immortality which, previous to His coming, had been confined to a few great intellects, and never descended to the masses, now received its final and complete vindication in the inspired life and teachings of the Great Master and His disciples. The impetus which His spirit gave to the civilization of the world will not cease until mankind has been lifted to the highest possible plane of development.

The favorite argument for the soul's immortality, and the one most frequently insisted upon, is drawn from the immateriality of its nature, but when this argument is carefully examined it will be found to rest upon no certain foundation, for the same reasoning might be advanced to prove the immortality of all the laws of the Material Universe, these being also immaterial in their nature. The immortality of a thing in no wise depends upon its constitution, but upon the will of the Great First Cause, upon whom all things are dependent; His will, and His will only, can confer upon them a never-ending existence. For aught we know, or have any just reason to think, the matter which forms the basis of the phenomenal Universe may be destined to exist forever. Even were it conceded that the soul is material in its nature, it would not be a necessary inference thence that the soul is destined to undergo dissolution with the body. The immortality of the soul, therefore, is in no wise concerned with its Materiality or Immateriality.

But if we cannot infer the eternal duration of the soul from its immaterial nature, there are other arguments, independent of the truths of revelation, which render it in the highest degree probable.

Firstly. The irrepressible longing after a future state which is common to all men in whom the moral faculties are at all developed, the intensity of the feeling being directly in proportion to the elevation of the moral sense.

This moral principle is to be regarded as the true essence of the soul, and is not to be confounded with mental power and attainments, which are mere appendages. A soul dwarfed almost to nothingness may be accompanied by the highest mental endowments, and the most humble in intellectual power and attainments may possess a spiritual nature of the most exalted type. The peasant and philosopher here meet on an equal footing—nay, the peasant may be able to instruct his would-be wiser neighbor.

Secondly. The consciousness that there is something within us which demands a more enduring existence than the short span of a human life for its full development appeals to us with overwhelming force. The old Greeks were so much influenced by this feeling that they compared the soul and the stages of its development with the stages of development of a butterfly; and the fully-developed insect was to them a symbol of the soul freed from its earthy tenement.

Thirdly. The mere existence of this longing and this consciousness in a highly-developed moral nature is positive evidence that they have been placed there, directly or indirectly, by the Great First Cause; and this great truth must be looked upon as the strongest argument for the eternal duration of the soul. The fact that all men have no such yearnings in no wise militates against the force of the argument; it only shows that they have not reached that point of moral development.

> "It must be so—Plato, thou reason'st well—
> Else whence this pleasing hope, this fond desire,
> This longing after immortality?
> Or whence this secret dread, and inward horror,
> Of falling into nought? Why shrinks the soul
> Back on herself, and startles at destruction?
> 'Tis the divinity that stirs within us;
> 'Tis Heav'n itself that points out an hereafter,

And intimates eternity to man.

* * * * * * * * *

The soul, secur'd in her existence, smiles
At the drawn dagger, and defies its point.
The stars shall fade away, the sun himself
Grow dim with age, and nature sink in years;
But thou shalt flourish in immortal youth,
Unhurt amidst the war of elements,
The wreck of matter, and the crush of worlds."

CHAPTER IX.

SOCIOGENESIS,* OR THE EVOLUTION OF SOCIETY.

SECTION 1.

A brief review of Society, and the Personal factor.

The laws of growth and development, which we have seen exercising such a potent influence in the material world in bringing forth not only the globe upon which we dwell, but also the innumerable and varied forms of life which it sustains, have been no less potent in bringing about that elaborate social structure which the civilization of the nineteenth century presents.

In Government, in Science, in Art, in the *practice* of Morality, and, indeed, throughout the whole social organism, we may trace the action of the law of Evolution. There has been a gradual but constant advance of the whole race from the earliest periods down to our own times.

The contrast which the society of this age presents to that of the past deepens as we go backward in time; it is a steady decline from the higher to the lower. The student of history, as he turns over the records of the past, may be likened to a traveler, who, starting from some lofty mountain region, gradually pursues his way to the sea. He may, at intervals, meet with hill and dale, but the general direction of the line of travel is one of descent. It is only by bringing within the field of vision the history of humanity as a whole that we are enabled to appreciate this sure and steady advance from the earliest times. Were we to confine our gaze to the civilization of one age or one nation, we might be able to trace its rise, progress, and final extinction, and might be tempted to deduce from this that the progress of the mass of humanity has been made by sudden leaps.

It is only by traveling over the region with an observing eye,

* Lat. *Socius*, a companion; and Gr. *Genesis*.

and with the aid of scientific appliances, that the traveler learns that a deep valley at the foot of the mountain chain may be much more elevated above the sea-level than the high hill near the coast. So the student of history will learn that what was a high civilization in one age may be absolutely much lower than the inferior civilization of another. He will also learn to appreciate the fact that the decadence of national greatness oftentimes furnishes the materials out of which a loftier condition of things arises—that civilization, disappearing in one age and nation, re-appears in another, but on a grander scale. The civilization of the East was followed by that of Greece, which, in its turn, was supplanted by that of Rome; from the *débris* of Roman greatness arose the feudal system, and its decline made modern European civilization possible. The discovery of a new continent furnished a fresh soil, free from the noisome weeds of traditional belief, in which the germs of free institutions, blown over from the Old World by the storms of persecution, took a deep and firm root. And now a new era dawned upon the world; a new civilization, such as the world had never before seen, came into being. The slender sapling, though rudely torn by the tempests which threatened to uproot it at its first setting out, has grown into a mighty tree, under whose benignant and wide-spreading branches the oppressed of all nations may find a refuge and a home. But it has done far more than to offer merely an asylum for the downtrodden; the feelings of personal liberty, which it fosters, have made themselves felt through the length and breadth of the mother-country, loosening the bonds of autocratic rule and elevating the whole race to a higher plane of development.

In forming an estimate of any civilization we must not be dazzled by the display of Individual genius which it may present, and confound the National Elevation with Personal Elevation. The monuments of literature, science, and art which a nation may possess are the products of Individual Greatness; and the mass of the people in whose midst these great works have been brought forth may be so steeped in ignorance and superstition as to be utterly unable to appreciate their possessions. *Indeed, in such a nation, the higher the Personal Elevation, the less is the probability that it will work a beneficial influence upon the masses.* The beacon, which throws its rays afar, cannot be seen at the base of the tower;

we must remove some distance ere its slanting beams can reach our eye, and the higher the elevation of the light the further must we remove. The highest efforts of genius must have a kindred mind to appreciate its loftier meanings; hence it is that such men are never appreciated by the masses of the age and nation which have given them birth. The estimate in which such men are held steadily advances with advancing civilization—the light which the beacon emits is received by a greater number of eyes. Oftentimes the rays reach the masses of the people, long ere they might otherwise have done, by being refracted, as it were, by numerous intermediate minds, who thus serve the purpose of interpreters.

The primary laws governing the production of Individual Genius are as obscure as the nature of the mind itself; and the *congenital factor*, which enters so largely into the equation of life, can never be determined.

Moses, Confucius, Plato, Aristotle, Copernicus, DesCartes, Newton, Shakspeare, Milton, and a host of others, seem to spring up spontaneously, and oftentimes in spite of the most adverse circumstances.

We have seen that in Mass Genius, or civilization, the ascent has been gradual from the remotest antiquity up to the present time, but nearly the reverse has been the case with Individual Genius.

That the past ages of the world furnish examples of personal greatness which more modern times cannot equal, no one who is competent to judge will deny. And this is true in every department of human effort, in philosophy, science, art, government, &c. We have, indeed, men of high mental caliber in our times, but the greatest among them are the first to acknowledge the immeasurable superiority of those who have gone before. Nor are such feelings the offspring of a sentimental reverence for what is old, but the result of a calm and judicious estimate of the relics of past ages, which have been diligently compared with the products of more modern times. The accumulated experience of centuries is indeed ours, but the mere possession of knowledge does not make great men.

Shakspeare, were he suddenly to appear among us, would be put to the blush by the merest school-boy, but who of our own times would be selected to measure mental strength with his? Newton might, with profit, enter himself as a pupil of one of our

ordinary schools, but there is not a man living to-day who is worthy to unloose the latchet of his shoe. With what dazed wonder would our own Franklin behold the feats of an ordinary and otherwise ignorant electrician of the year 1884! Indeed, if all those intellectual giants who are the crowning glory of the race should suddenly appear amongst us, they could all be traught by every blockhead who had penetrated beyond the portals of one of our institutions of learning. Imagine Socrates, Plato, Aristotle, Galen, Copernicus, Galileo, Francis Bacon, Newton, &c., gathered around a fledgling from one of our universities, drinking in words of wisdom! Absurd as such a picture appears, it is nevertheless true that they would all learn much that they never even dreamed of before.

Whole sciences have come into being since they lived, and much of the knowledge with which they were acquainted and, did so much to establish, has been revolutionized to such an extent that they would be dumbfounded. Yet not one of the names above-mentioned has a living equal. From this we may recognize the truth that whilst the average genius of the race has been steadily advancing to a higher level by virtue of its accumulated inheritance, individual genius never attains to those lofty heights which past ages of the world brought forth. It seems as if individual greatness is being swallowed up by mass greatness, and this becomes more and more apparent as civilization advances. Besides the very important and *obscure* congenital factor already referred to, it is possible that one explanation of this gradual decline of the Individual may be found in the methods of instruction which prevail at the present day. The young are overladened with facts the relations of which they cannot grasp, and all their mental vigor is exhausted in retaining these in the mind to the curtailment of the exercise of the reasoning powers. They succed, indeed, in accumulating an immense mass of facts, but they fail to digest and assimilate it, and, instead of nourishing and strengthening, the intellect is really weakened and overpowered by it. The methods of instruction which produced the great men of Greece and the Renaissance were carried on in very different fashion. Then men of genius alone assumed to themselves the office of teachers, and they succeeded in infusing into their pupils somewhat of the spirit by which they themselves were moved. The

reason was appealed to at every step, and every faculty of the mind was subjected to a thorough and judicious training. After passing through such a mental gymnasium, they were prepared to grapple with the great problems of the intellect, of whatever nature they might be. Hence, they became what might be termed Universal Men, and the whole field of knowledge became the scene of their operations.

Another explanation of the gradual decline in the number of such men may be discovered in the constant widening of the field of knowledge, rendering it more and more difficult for a single mind to compass the whole. Students of special branches thus became more and more numerous as knowledge extended its limits. In concentrating all their powers on special studies, a tremendous impetus was given to the progress of knowledge, but this general advance was made at the sacrifice of the Individual; for now the scope of his vision became narrowed down to his own specialty, and the close relationship and independence existing among all branches of science could no longer be fully appreciated. In quite recent times a few great generalizers have arisen, who, skimming over the vast field, have attempted to unify knowledge into a coherent mass, and to discover the relations existing throughout the whole. But such efforts have always been attended by a great sacrifice of original investigation and discovery. The two greatest generalizers of this century are August Comte and Herbert Spencer, the latter having followed the lead of the former. But neither of these men are known as original investigators, and they have in no sense added to the sum of human knowledge. Making use of the materials which others have supplied with such painstaking labor, they have built up their systems. Even the architectural plans followed are not original with them, but the result of the labors of men far abler than they.

It will be seen, therefore, that one of the factors which goes to make truly great men is necessarily absent in modern times. A man cannot hope to be both a great generalizer and a great original investigator at one and the same time; one must inevitably be sacrificed to the other. Hence, the original germs of genius can never receive that *double nutrition* which might insure its development to those imposing heights which past ages of the world offer for our contemplation.

It is not easy to conceive, taking a random case which might be multiplied indefinitely, how a man of the same magnitude of Leonardo da Vinci could be produced by our own times. Philosopher, scientist, architect, painter, sculptor, and engineer, he manifested an aptitude for all which would place him at the head of these different branches were he living to-day. He not only mastered all the knowledge then known in these various departments, but he extended the limits of each by original work. As a painter, he ranked among the first of his own time, and the fresco of the Lord's Supper in the refectory of a convent at Milan, though marred by the hand of time and vandalism, still bears testimony to his transcendent genius. As an architect, he was only second to his great contemporary, Michael Angelo; and as a philosopher and practical scientist, he stood among the first of that age. The historian Hallam thus sums up his scientific acquirements: "The discoveries which made Galileo, and Kepler, and other names illustrious, the system of Copernicus, the very theories of recent geologers, are anticipated by Da Vinci within the compass of a very few pages. * * * * * He first laid down the grand principle of Bacon, that experiment and observation must be the guide to just theory."

This picture, it must be confessed, is somewhat overdrawn. The grand principle of Bacon which Hallam refers to was fully recognized by Albertus Magnus and Roger Bacon, and is very clearly laid down by Aristotle at the very commencement of his "Physics." As to his anticipating the discoveries of Copernicus, Galileo, and Kepler, that is only partially true, for he failed to subject his theories to the test of mathematical demonstration; or, if he did, such proofs have not come down to us. But there is sufficient evidence that he did make discoveries in physical science important enough to distinguish him as one of the first men of his day.

Da Vinci is but one of many names that might be mentioned that united such vast acquirements with such wonderful power for original investigation. Copernicus, Galileo, and Kepler are illustrations. Copernicus was probably one of the most eminent physicians of his day, as he certainly was the greatest mathematician and astronomer.

We have thus good reason for believing that the conditions for producing great men are not so favorable as they once were; one

of the chief factors is developed at the expense of the other, hence failure to attain the same high and even development. Given the *same* original mental-power, and surround it by the *best* conditions which prevailed in Greece, or which existed in modern Europe from the twelfth to the seventeenth centuries, and it will attain to greater heights than if it were surrounded by the best conditions of the nineteenth.

We may draw a parallel between a mind so circumstanced and a boy reared to great expectations and the same boy curtailed somewhat in his worldly prospects. The child who is brought up in the lap of luxury, pampered and indulged by adoring parents, and not permitted to ask in vain, will, in nine cases out of ten, whatever be his original powers, turn out a worthless or, at best, a very mediocre man. The wholesome discipline which mental effort and self-renunciation bring will have no place in the formation of his character, and the virtues which spring from such discipline will either be entirely wanting or very much dwarfed. On the other hand, the same child with more discreet training, who has been taught that in a measure he is to be the "architect of his own fortunes," might have become a brilliant light in his day and generation.

It has been very felicitously said by an eminent writer that genius is a plant which only grows in rocky ground. It is true that if the soil be too rocky the plant may be deprived of the moisture necessary for its growth, or be unable to withstand the violence of the storm; in the one case, its tender roots will be shriveled by the withering droughts, and, in the other be uprooted and carried on the wings of the tempest.

It is a notorious fact that the lives of the great majority of those who have attained to extraordinary intellectual excellence, and who have made good their claim to this distinction by their great achievements in philosophy, science, literature, and art, present us with a series of pictures in which the shadows, at least in their younger days, predominate over the lights. The history of the race abounds in instances where genius has been elicited by the wan caresses of Poverty that might otherwise have been smothered in the lap of Luxury. Some of the most brilliant gems of our literature we owe to efforts to stave off the pangs of hunger; and it is not too much to assert that these would never have seen

the light had their authors been indulged and pampered by fortune. Dr. Johnson used to confess that he was so indolent by nature that he would never have written a line had not poverty urged him on; and we may safely affirm that neither the "Wanderer" nor "Rambler," much less the Dictionary, would ever have been produced had he been born with a silver spoon in his mouth and fanned by the downy wings of luxury.

Shakspeare's stores of wealth would never have been poured out had not the iron goad pricked him on. The "Vicar of Wakefield" and the "Deserted Village" would not have brought tears to the eyes of tens of thousands had Oliver Goldsmith been the child of wealth.

But the most favorable conditions for the development of genius are found where the lights and shadows are equally blended; where the obstacles to be overcome are just sufficient to call forth a healthy exercise of the mental faculties; where Fortune is neither too coy nor yet too bold, but "discreetly wise."

Luxury and mental decadence follow one another as inevitably as the shadow its substance; and in this great truth we may contemplate a wise provision of nature. For, were it otherwise, did not the wealth amassed by the mental acumen of one generation entail a certain degree of intellectual degradation on the next the equilibrium of society would be seriously disturbed. The double inheritance of wealth and mental power would tend to augment one another from generation to generation, and the gulf separating the few fortunate ones from their more numerous less fortunate fellows would be constantly widening and with increasing rapidity. The higher the elevation of the few, the deeper would become the degradation of the many. In monarchical institutions, where it is deemed necessary to have a privileged class intermediate between the monarch and the people, the intellectual deficiencies of this privileged class, which would soon insure the dissipation of accumulated wealth, is compensated for by special enactments on the part of the State. The State thus takes the part of a parent toward this class, shielding them from the effects of their own imbecility. Were this support withdrawn, the aristocracies of Europe would crumble into nothing in a few generations.

Through the working of this all-important law, for so it may be termed, *of the dissipation of mental energy under the influence of*

luxury, the condition of society at large is ameliorated and an even development assured. The wealth power of the one is neutralized by the intellectual power of the other, and the individuals representing these classes are constantly changing their relations. This healthy circulation insures the normal growth of the social organism as a whole and prevents decay.

But let us return to the parallel we were about to draw in illustration of the fact that modern times do not offer the same advantages for the growth of Individual Genius as former ages of the world. The immense accumulation of knowledge, handed down from generation to generation, renders it more and more difficult for the individual to grasp the whole. Of the utter hopelessness of mastering all knowledge, his first initiation soon convinces him. The student, therefore, selects some special branch, and cultivates this to the almost entire exclusion of every other department. This tendency to specialize, to concentrate all the powers upon one point, to the neglect of a wider survey of the field of nature, steadily increases with the advance of knowledge. The few who do aspire to a wider view must give up all hope of original investigation, and devote all their strength to the comprehension and interpretation of the discoveries of others. The action of wealth of knowledge in thus discouraging the development of one of the two principal factors which nourish genius may very well be compared to the degrading influence which pecuniary wealth exercises upon the mind. In former ages, the world was poorer in knowledge, and the mind, which to-day is confined to a single branch, or dissipated over an immeasurable field, would then have been engaged in the *practical* study of the whole field of nature as then known, and would thus derive the double advantage which original investigation and a wide range of vision afford. The mind so conditioned would naturally attain to greater strength; and a glance at the great names which grace the past history of the world will furnish indisputable proof of this. That there are many other factors which enter into the production of great genius is beyond question, but those referred to appeal to the writer with peculiar force. The decline of Individual Greatness with the advance of Mass Greatness seems as well marked in the domain of Literature and the arts as in that of philosophy.

We have a greater number of writers, painters, and sculptors

than at any other period of the world's history, but they never attain to the same degree of excellence that distinguished earlier times. The museums of Europe are filled with specimens of antique art which bear witness to the superior genius of the ancients over the moderns. It must be confessed that many of these works are even superior to anything the Renaissance produced; and Michael Angelo, the greatest sculptor of that period, was the first to recognize the superior excellence of the ancients. The fire that burned so brightly in his own bosom was nourished and strengthened by the study and contemplation of the works of antiquity. In the Vatican collection there is still to be seen a mutilated marble which bears the name of the Torso of Michael Angelo, because it had been an object of constant study to the great sculptor. Of the specimens of antique art which have always defied the competition of later times, may be noted the Apollo, Antinous, and Laocoön of the Vatican collection; the Venus de Medici of the Florentine, and the Venus de Milo of the Louvre; the Dying Gladiator of the Capitol of Rome, and the Farnese Hercules and Farnese Bull of the Museo Barbonico, at Naples. Yet these are the productions of a time when art was on the decline in Greece. Some of the works above mentioned are copies of originals produced at a much earlier period.

Of the painting of the Greeks and Romans, nothing remains but a few frescoes. The perishable nature of canvas is such that the absence of all remains of ancient painting is not surprising; but that they had attained to a high degree of excellence there can be no doubt. Many fine Mosaics have been discovered, and we know that this peculiar art could not have arrived at such perfection had not painting reached a high degree of excellence. The celebrated Mosaic of Darius at the battle of Arbela, found at Pompeii, and now in the museum at Naples, is a work of wonderful power and skill. But in addition to such proofs, we have the testimony of the famous writers of Greece and Rome, who were excellent judges of art, and familiar with the finest sculpture and most beautiful architecture. It is fair to presume, therefore, that their extravagant praises of the painting of their day were not without some foundation in fact. Thus we are told that as early as 718 B. C., a painting by Bularchus was purchased by Candaules, King of Lydia, for its weight in gold. From his time the art continued to improve

until it reached its climax in the person of Apelles, about the third century B. C. A Venus painted by him was regarded as the most faultless production of Grecian genius, and was purchased, long after the artist's death, for one hundred talents (nearly $100,000) by the Emperor Augustus.

The anecdote related of the two celebrated rivals, Zeuxis and Parrhasius, who flourished about 450 B. C., is familiar to almost every one.

There is scarcely room for doubt, therefore, that the ancients excelled in Painting as much as they did in Sculpture. But whether the painting of Greece surpassed that of the Renaissance or not, it is certain that the Renaissance far excelled our own time; and of this we have abundant proof in the collections of modern Europe. Our artists are weaklings compared with the giants of the past, and if this is exhibited in their works, what a vast inferiority there must be in mental power! But if Personal Genius for art no longer attains to those heights which it once did, the appreciation of the masses, mass genius, is far greater than it once was; and this is proved by the wonderful multiplication of private and public collections, and the increased number of artists. In architecture, the remains of ancient temples still attest their genius; and everything that is beautiful in our own has been drawn from that of Greece.

If we turn to literature where will we find evidence of such exalted genius as the literature of Greece and Rome afford? Standing on the very verge of the historical horizon, we behold Homer and Hesiod. The Illiad has furnished the model upon which all the great epic poems have been fashioned since Homer's day. From its wild and luxuriant vegetation has been culled the fairest flowers which deck the trim *parterres* of later poets. It is doubtful if our own great Milton would have attained to his sublime heights had not his genius been fostered by the blind bard of Greece. But in sublimity Homer must give way to the Hebrew poets, Job and Isaiah, and it was from the study of these that Milton learned to soar above the old Greek to whom he owed so much.

The ideas which the author has attempted to bring out in the preceding pages may be illustrated by the following diagram and table.

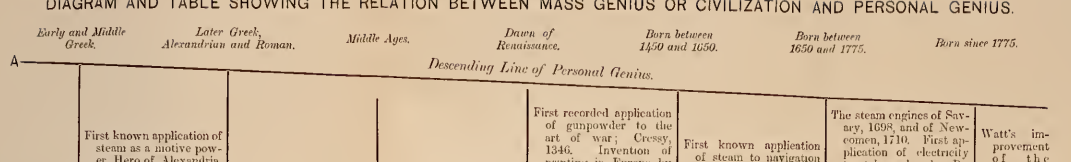
A glance at the diagram will show that, whilst the plane of Personal Genius has been a descending one, the plane of Mass Genius,

..... 1769	names associated with
..... 1770	the movement.
..... 1773	
..... 1773	
..... 1775	

l decline of personal genius; the line B

f their age and country. As nothing
an of surpassing genius, has descended
ss in these directions is indeterminable,
us, that of the military commander is
ere all notoriously deficient in every-
Science, or Art, but his moral character

DIAGRAM AND TABLE SHOWING THE RELATION BETWEEN MASS GENIUS OR CIVILIZATION AND PERSONAL GENIUS.



THE MASSES

	Cent. B. C.
Homer,	10 & 9
Hesiod,	10 & 9
Thales,	7
Anaximaoder	6
Pythagoras,	6
Anaximines,	6
Aeschylus,	6 & 5
Pindar,	6 & 5
Herodotus,	5
Phidias,	5
Polygnotus	5
Parmenides,	5
Heraclitus,	5
Euripides,	5
Sophocles,	5
Socrates,	5 & 4
Hippocrates,	5 & 4
Plato,	5 & 4
Thucidides,	5 & 4
Empedocles,	5 & 4
Zeno, of Elea,	5 & 4
Xenophon,	5 & 4
Scopas,	4
Zeuxis,	4
Apelles,	4
Aristotle,	4
Pyrrho,	4
Aristophanes,	4
Parrhasius,	4
Praxitiles,	4 & 3
Epicurus,	4 & 3

	B. C.
Euclid,	3
Archimedes,	3
Hipparchus,	2
Terence.	2
Cicero,	1
Lucretius,	1
Catullus,	1
Sallust,	1
Virgil,	1
Horace,	1
	B. C. & A. D.
Ovid,	1 & 1
Livy,	1 & 1
Seneca,	1 & 1
Celsus,	1 & 1
Glycon,	1 & 1
Apollonius,	1 & 1
	A. D.
Agesander,	1
Zenodorus,	1
Tacitus,	1
Pliny,	1
Philo,	1
Lucanus,	1
Galen,	2
Ptolemy,	2
Plotinus,	3
Augustine,	3

From the Fourth Century to the Thirteenth is embraced that dark period, the middle ages, during which personal genius seemed to slumber.—What there was of original investigation was almost entirely confined to the Arabians, who made great advances in Medicine and the Sciences upon which it is based. Philosophy, Mathematics, and Astronomy were also cultivated with success. The following are some of the names most noted among them:

Al-Maoaur,	8
Albumazar,	8 & 9
Rhazes,	9 & 10
Alfarabi,	9 & 10
Ali-Abbas,	10
Avicenna,	10 & 11
Alghazali,	11 & 12
Avenzoar,	11 & 12
Edrisi,	11 & 12
Abulkasim,	11 & 12
Aben-Ezra,	12
Averroes,	12

	Born.
Alain de Lille,	1114
Albertus Magnus,	1205
Roger Bacon,	1214
Aquinas,	1227
Raymond Lully,	1235
Arnoldus de Villa Nova,	1235
Cimabue,	1240
Cecco d'Ascoli,	1257
Dante,	1265
Duns Scotus,	1265
Pisano,	1270
Giotto,	1276
Thomas Bradwardine	1290
Petrarch,	1304
Boccaccio,	1313
Chaucer,	1328
Van Eyck,	1366
Ghiberti,	1380
Donatello,	1383

	Born.
Leonardo DaVinci,	1452
Albert Durer,	1471
Copernicus,	1473
Ariosto,	1474
Michael Angelo,	1474
Titian,	1477
Raffaelle,	1483
Luther,	1483
Corregio,	1494
Holbein,	1498
Benvenuto Chellini,	1500
Tintoretto,	1512
Camoens,	1525
Tasso,	1544
Spenser,	1553
Cervantes,	1547
Francis Bacon,	1561
Galileo,	1564
Shakspere,	1564
Paul Veronese,	1530
Rubens,	1577
Kepler,	1571
Harvey,	1578
Des Cartes,	1596
Corneille,	1606
Milton,	1608
Salvator Rosa,	1615
Murillo,	1618
Spinoza,	1632
Locke,	1632
Addison,	1632
Dryden,	1631
Racine,	1639
Newton,	1642
Leibnitz,	1646

	Born.
Rousseau,	1670
Swift,	1677
Berkeley,	1684
Pope,	1688
Richardson,	1689
Voltaire,	1694
Thompson,	1700
Liocœus,	1707
Johnson,	1709
Buffon,	1707
Hume,	1711
Kant,	1724
Goldsmith,	1728
Reynolds,	1723
Gibbon,	1737
Galvani,	1737
Herschel,	1738
West,	1738
Condorcet,	1743
Franklin,	1706
Lamarck,	1744
Laplace,	1749
Goethe,	1749
Schiller,	1759
David,	1748
Flaxman,	1755
Canova,	1757
Dannecker,	1758
Opiè,	1761
Humboldt,	1769
Cuvier,	1769
Thorwaldsen,	1770
Young,	1773
Priestly,	1773
Turner,	1775

Since 1775 many great men have been born who have enriched philosophy, science, literature, and art; but whilst they have exceeded in number, they have fallen far short in mental power, those of the preceding ages. The rapid strides which civilization has made during the past century are largely due to the successful application of Watt's discoveries; to locomotion by Trevethick, 1804, and Stephenson, 1814; to navigation by Fulton, 1807. The discovery of electro-magnetism by Oersted and Ampere, 1820, paved the way for the present systems of telegraphy. In the year 1837, the first general and successful introduction of telegraphy took place. Morse, Steinhil, Wheatstone, and Cooke are the chief names associated with the movement.

The vertical lines mark the relative heights to which individual genius attained at various periods of the world's history. The line A shows the gradual decline of personal genius; the line B the gradual ascent of civilization or mass genius.

This table embraces a few of the great men who have illustrated the history of the world, and whose personal efforts entitle them to rank the first of their age and country. As nothing is known of Individual effort prior to the Early Greek period, the Personal Genius of that early time cannot be estimated. Moses, though no doubt a man of surpassing genius, has descended to us as an inspired teacher and Lawgiver. The names of other great Lawgivers and Rulers are omitted, for the individual equation which insures success in these directions is indeterminable, and the influence of the laws of Evolution are more discernible. Nor are names distinguished for exploits in war mentioned, for, of all orders of genius, that of the military commander is the lowest, depending more upon favoring circumstances and action than upon mental power and attainments. Marlborough, Nelson, and Wellington were all notoriously deficient in everything that constitutes mental excellence. Napoleon I was undoubtedly a man of great mental power, and might have attained distinction in Philosophy, Science, or Art, but his moral character was blackened by every degrading vice.

or Civilization, has been an ascending one. The highest Individual elevation lies in the past; the highest Mass elevation lies in the present.

Thus the dawn of history presents us with Man, intellectually considered, at his best. This truth might be interpreted as militating against the theory of Evolution, but that this would not be a legitimate inference the writer will endeavor to show.

The doctrine of Evolution, as expounded in these pages, asserts *Material Continuity* from the Bioplasm which forms the main trunk (see chart) of the tree of Life up to Man. It affirms that each succeeding generation of individuals *along this line* was a little higher than its predecessor. It affirms that this constant growth was in obedience to *Involved* or *Superimposed* Laws. It affirms that when the animal had attained to that height which led it to seek after the Author of its being, then the Soul became manifest (or evolved) upon the Earth. When, in obedience to these laws, the Man Animal developed into the Man Intellectual and progressed in civilization to a point which enabled him to appreciate the full significance of a revelation, then that revelation was made to him. If there has been a revelation made to man by his Maker, (and that there has been I will endeavor to prove further on,) it is not too much to assume that the first human being so favored must have been endowed, in a very remarkable degree, with those faculties termed Intellectual.

I will now proceed to show that, reasoning from analogy, we may justly assume that Adam, or the first man to whom a direct revelation was made, is to be regarded as the highest Intellectual type of his kind. I may say just here, by way of caution, that we must not confound *Intellectual Power* with *Intellectual Attainments.* There are many men of the present generation who have greater attainments (more knowledge of facts) than any of past generations, but they fall short in mental power. It is not necessary to assume, therefore, that Adam possessed a knowledge of facts equal to that of men now living, but that he did possess a higher degree of producing power, the test of intellectual superiority, we may well believe.

The study of the fossil remains found in the rocky strata of the earth, reveals the fact that the various classes of animals with which we are now acquainted reached their acme, both in size and

numbers, in past geologic time. Origin, growth, and declension mark the history of all.

Thus the Reptilian class, taking its origin in the latter part of the Palæozoic, reached its culminating point in the Mesozoic. "Never in the history of the earth, before or since," says a distinguished geologist, "did this class reach so high a point in numbers, variety of form, size, or elevation in the scale of organization." The same may be said of birds, mammals, and all other classes of animals. The mammalian class took its rise at the beginning of the Mesozoic and culminated in the huge mastadons, &c., of the Cenozoic. Man is, indeed, classed among the mammals by the naturalist, but man regarded simply as an animal is immeasurably inferior to many existing brutes. What the huge reptiles, birds, and mammals were to the eras in which they flourished in such vast numbers and attained such enormous size, that the man Adam was to the Race Intellectually. We may safely assume that the human race had gradually developed in intellectual strength until it attained its maximum in the Man, to whom a *direct revelation was given.*

We know that Intellectual greatness, *in the individual,* is on the decline; hence we must look to the past to find the highest type.

That there existed on the earth a pre-Adamite race, from which Adam himself was descended, seems to be indicated in the fourth chapter Genesis, fourteenth, fifteenth, and sixteenth verses.

The preceding verses narrate the birth of Cain and Abel, and the quarrel between them which resulted in the murder of Abel. No reference is made to any other children of Adam and Eve, and we are left to infer that at this time Cain and Abel were the only children they possessed; yet in the fourteenth verse we have as follows:

14. Behold, thou hast driven me out this day from the face of the earth; and from thy face shall I be hid; and I shall be a fugitive and a vagabond in the earth; and it shall come to pass that EVERY ONE *that findeth me shall slay me.*

15. And the Lord said unto him, therefore WHOSOEVER slayeth Cain vengeance shall be taken on him sevenfold. And the Lord set a mark on Cain, lest ANY finding him should kill him.

16. And Cain went out from the presence of the Lord, and dwelt in the land of Nod, (land of wandering,) on the East of Eden.

17. And Cain knew his wife [Where did he get her? We are not told that Adam had any daughters at this time] and she conceived, &c.

Again, the first and second verses of the sixth chapter seem to furnish further evidence of a pre-Adamite race.

1. And it came to pass, when men began to multiply on the face of the earth, and daughters were born unto them—

2. That the *Sons* of God saw the daughters of men that they were fair; and they took them wives of all which they chose.

This last verse, altogether inexplicable on the supposition that Adam was literally the first man on the earth, receives a rational explanation if we assume that the earth was already peopled at the time when he appears on the scene. We may now interpret the phrase "*the sons of God*" as referring to the descendants of Adam, and the phrase "*the daughters of Men*" as referring to the descendants of the wandering hordes which peopled the earth.

In the foregoing pages I have attempted to give a rational explanation of the decline of individual genius, and, in the table of names, have appealed to history to support the argument. That table does not run back anterior to the dawn of Greek civilization, as we have no remains of individual effort prior to that time except what is embalmed in the Bible and other religious and moral works.

From a study of many of the Old Testament writings we may gather, that the men who produced them were of the highest order of genius, whether we regard them as directly inspired or not. We may safely affirm, then, that Man, individually considered, presents us with higher and higher intellectual power as we ascend in antiquity, culminating in him who first received a direct revelation from on High. Whilst, therefore, we may regard Adam as the highest type of man Intellectually considered, yet humanity did not reach its maximum point in him; still another and higher type was to be unfolded. Intellectual grandeur must give place to Moral or Spiritual grandeur. The last and highest type of humanity found its fulfilment in the Second or Spiritual Adam. As the first Adam was the type of Man Intellectual, so the Second Adam was the type of Man Spiritual. In the person of Jesus Christ we behold the complete Evolvement of the Supreme Will in its relation to Man in this state of being. Bend our faculties

to their utmost, we can conceive of no higher life than that which the Personality of Christ offers for our contemplation.

From the days of Christ to our own times we may trace a gradual decline of Spirituality in the Individual. But this Individual retrogression has been attended by Mass progression; and, if the peaks are not so high, the valleys are not so deep. Mankind as a whole is advancing both in Intelligence and the Spiritual apprehension of things, and we may reasonably infer that this upward growth will continue until the whole race has attained an even plane of development. Having considered in a general way the past status of the race, both Personal and in Mass, as compared with the present, we will now endeavor to point out the course of its development from its original brute state.

Section II.

Society as an Organism.

Society has been likened to an organism, and the ingenuity of modern writers has carried the comparison to almost fanciful lengths.

Whilst there is a very radical difference between a society consisting of rational human beings, and a society consisting of animal cells, yet parallels may be drawn between the two which will lead to a more thorough understanding of the social state.

Plato, in the "Republic," compares the functions of the state to the faculties of the human mind, while Hobbes has drawn a still more definite comparison between it and the human body. He says: "That great Leviathian called a commonwealth, or state, in Latin *Civitas*, which is but an artificial man, though of greater stature and strength than the natural, for whose protection and defense it was intended, and in which the *Sovereignty* is an artificial *Soul*, as giving life and motion to the whole body; the *magistrates* and other *officers of judicature* and *execution* artificial *joints; reward* and *punishment*, by which, fastened to the seat of the Sovereignty, every joint and member is moved to perform his duty, are the *nerves*, that do the same in the natural body; the *wealth* and *riches* of all the particular members are the *strength; Salus populi*, the people's safety, the business; counsellors, by whom all things needful for it to know are suggested unto it, are the memory; *Equity*

and *Laws*, an artificial *reason* and *will; concord, health; sedition, sickness; civil war, death.*"

In the writings of more recent authors we find still more elaborate correspondencies traced. Thus, the central government, being the seat of the deliberative faculties of the state, corresponds to the brain of the animal body; the means made use of to convey the mandates of the law-making power to the numerous executive functionaries are the nerves, the functionaries themselves being the muscles and limbs; those aggregations of humanity, where raw material is manufactured and collected for distribution, may be compared with the glandular system: the highways of traffic, by which the great centers distribute their manufactured material to the social organism, are the vascular system. The military establishments correspond with the teeth and claws of the social animal, and, in proportion to the ferocious character of the beast, are these developed. The highest animal, Man, is but poorly provided by nature with such weapons; so, in the highest civilized society, the United States, the military establishment is considered of but little importance to the well-being of the state.

If we compare the lowest societies with the lowest animal organisms, the correspondencies above noted will still hold. In such animals there is no differentiation into distinct organs: there is no nervous system, no glandular, no vascular apparatus, but the whole animal is *apparently* homogeneous throughout, both in structure and function; that is to say, the business of every cell of which it is composed is the same as that of every other cell. Thus, in *amœba*, the distinction of parts is so obscure, and the functions of every part so similar to the functions of every other, that the closest examination fails to detect any difference. The structure of the lowest savage communities may very well be likened to such an animal organism. Among such, government is so obscure and uncertain that it is hardly worthy of the name; there is no division of labor, every man performing the same duties as every other; there are no manufacturing centers; and there is no regular system of traffic necessitating the elaborate net-work of communication which is so well developed in higher societies. By continuing to trace out these correspondencies, we might find every division of the animal kingdom paralleled, in a measure, by some social state among men. As animal life, considered both in the individual

and in the race, is the result of development, so is the social organism a consequence of gradual growth, both in its special as well as general phases.

In the chapter on Philogenesis, we saw how the animal form in the course of its development passed through the same states which characterized its race development; so, in the social organism, we find reproduced in the family life the *primitive type* of society. As Phylogenesis is the study of the development of animal life as a whole, so Sociogenesis is the study of the development of the social life of the race from its commencement. What Paleontology is to Phylogeny, that history, including the study of language, is to Sociogeny. The development of society, at least from a certain point, has never been questioned, for we have only to turn over the leaves of history; but the data upon which the development of life rests are not so easily furnished, and it has only been in recent times that the historical records of the rocks have been open to the inspection of men.

We have already seen that, both from a scientific and religious stand-point, we are justified in believing that man has been created by an evolving process from the lower creation, and not instantaneously called into existence from inorganic matter and endowed with the highest faculties of the race. The successive steps which primitive man took in his upward course are only hinted at in Genesis, and to form any conception of the developmental process which elevated him so high above his brute ancestors recourse must be had to other sources of knowledge. The deductions of science, the study of the higher brutes, and the lowest phases of existing man, are the means we must make use of to trace the course of the evolving process.

Man being in his physical make-up closely allied to the higher order of existing apes, we are justified in asserting that his immediate brute progenitor, long since extinct, must have borne a still greater resemblance to these existing apes in general appearance, habits, and geographical distribution.* Existing apes inhabit warm

* The theory of the celebrated Frenchman, M. Bailley, that man originated around the North Pole, has lately been revived. He endeavored to show that the early civilizers of Asia must have come from a northern region. If man did originate around the North Pole, the climate at that point must have been tropical in character.

climates, are vegetarian in their diet, have no fixed abode, and are naked, except their natural covering of hair. We are justified in believing that man's immediate progenitor resembled existing apes in all these particulars, though probably the hairy covering was less pronounced. As the brute developed into man, this hairy coating became less and less.

That man must have been originally vegetarian in his diet is shown by the formation of his digestive apparatus, which is obviously better adapted for fruits and tender roots, which are easily digested without artificial preparation, than for the digestion of uncooked flesh. The vegetarian habits of the early man are also clearly indicated in the Biblical record.

"And God said, Behold, I have given you every herb-bearing seed which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat."—Genesis 1 : 19.

A deficient supply of vegetable food would compel primitive man at times to resort to a carnivorous diet. Among savage tribes inhabiting districts where the supply of fruit is abundant, flesh is rarely eaten, but among those living in high latitudes, where nature is not so lavish in her bounty, they are almost exclusively fish and meat eaters. The discovery of fire, that inestimable boon to the race, enabled him to prepare his food by heat, thus making a flesh diet at once more palatable as well as more wholesome. The higher orders of apes are not gregarious in their habits, and from this we may infer that primitive man was not very sociable with his fellows, and led rather a solitary life with the partner or partners of his bosom. These unions probably lasted but a short time, a new division taking place among the males at certain intervals. The offspring would naturally fall to the lot of the mother, under whose protection they would remain until able to look out for themselves, when all maternal and filial attachment would disappear. Even among some existing savages these feelings are so poorly developed that the bond of union between the two is severed as soon as the child attains a responsible age and can take care of itself. With the growth of intelligence and language, the great advantages arising from more enduring association would be more and more appreciated; and in the formation of a family life, more or less permanent, we may recognize the first steps toward the or-

ganization of society. The celebrated Condorcet, writing about a century ago, says: "Une société de famille paraît naturelle à l'homme. Formée d'abord par le besoin que les enfants ont de leurs parents, par la tendresse des mères, par celle des pères, quoique moins générale et moins vive, la longue durée de ce besoin a donné le temps de naître et de se développer á un sentiment qui a dû inspirer le désir de perpétuer cette réunion. Cette même durée a suffi pour en faire sentir les avantages. Une famille placée sur un sol qui offrait une subsistence facile, a pu ensuite se multiplier et devenir une peuplade."

Thus, to those feelings of tenderness for offspring, which we see manifested even by the brute creation, the origin of the family is due. The advantages arising from such association would become more and more conspicuous with advancing civilization. A union of families would form the tribe, and from the bringing together of tribes the nation would result. But consolidation into national existence only takes place after a comparatively high degree of civilization has been attained.

The family being the nucleus of social organization we would naturally infer that the first form of government among men (if we except the previous state of self-rule) was patriarchal in its character. That such was the fact, the early history of nations and numerous examples among existing savages furnish ample proof. On the aggregation of families into tribes this form of government would be modified and give place to chieftainship, at first elective and then hereditary, and from the latter, by natural course of development, would spring kingship. In the tribe the election of a chief would naturally turn upon personal superiority of some kind—mental, physical, or both. Among the brutes physical strength dominates the herd, but as man emerged from his original state another power—that derived from superior mental endowments—began to make itself felt.

Disease and death are alike the heritage and the terror of the Civilized and the Uncivilized, and the Savage, who, by some fortunate accident, discovered that a certain herb, bark, or root was efficacious in sickness, or relieved the agonies of pain, would at once be raised to prominence. He would soon learn to know that knowledge brings power, and would jealously guard the secrets which gave him such superiority over his fellows. His more ig-

norant companions would soon begin to look upon him with superstitious veneration as endowed with supernatural gifts. Natural cunning would teach the Medicine Man to make the most of his knowledge, and he would, in time, come to be regarded as the head man in all affairs of importance affecting the tribe, whether of a political or religious character. This natural inference is corroborated by the facts of history, and by the conditions existing among most savage tribes of the present day. The position of the Medicine Man as the chief of the tribe might be disputed, in times of militancy, by the most renowned warrior, and the chief power might thus be divided between them. Such was and is the general condition of affairs among the North American Indians, and many other savage tribes.

Among the early civilizations the establishment of a priestly caste, the depositaries of all knowledge, and the political as well as religious rulers of the nation, grew out of the preëminence of the Medicine Man over other members of the tribe. His secrets would be transmitted to a select few, or to the members of his own family, and, in course of time, as tribes amalgamated into nations, a body of men would arise in whose hands rested all knowledge and power. Among the Hindoos and ancient Egyptians, the chief priest was either king himself or ruler of the king. During a period of extreme militancy or of conquest, the power of the Priesthood might be weakened, but it would speedily recover its ascendancy.

The civilizations of Japan and of Peru, at its discovery, furnish good examples of the rule of a priestly caste in which the chief of the priesthood sat upon the throne. In Japan the temporal authority was usurped by the commander-in-chief of the forces, and for some centuries two emperors, the spiritual and temporal, ruled in Japan. But in recent years the Tycoon has been stripped of his authority, and the Mikado, or Spiritual Emperor, re-instated in full temporal power.

The history of Mediæval Europe affords a remarkable instance of reversion to priestly authority, during a period of universal militancy. The Pope of Rome was the recognized sovereign of all Christendom during several centuries, and the crowned heads of Europe were little more than tributary princes.

Section III.

Development of Language, and the Social Functions.

Simultaneously with the growth of the family relation, came the development of language. From the inarticulate noises of the brute to the rational and connected language of man is, indeed, a tremendous stride, but we have good reason for believing that the one was developed from the other by insensible gradations. Nor is there anything in Genesis which is antagonistic to this interpretation. We are not told that the first man, Adam, was *directly* endowed with a fully equipped vocabulary of words by his Maker; "and out of the ground the Lord God formed every beast of the field, and every fowl of the air, and brought them unto Adam, *to see what he would call them;* and whatsoever Adam called every living creature, that was the name thereof."—Genesis ii, 19.

It will be observed that the *names* themselves are not given to Adam, but that he originates them himself. That the *power* to do so was given him is, of course, implied. We are not to infer, then, that man began with words, but with the power of forming words. Remembering that, in its ultimate nature, Evolution can only be defined as the continuous unfolding of the Will of the Great First Cause, the difficulty of understanding how language might have had a beginning through what we designate natural means, secondary laws, at once disappears.

Words are the symbols of things, and with the growth of the knowledge of things must arise the symbols by which they are represented. These symbols are certain coherent sounds produced by the organs of speech at the suggestion of something within us called ideas. Among the brutes coherent ideas cannot be said to exist, hence with them there is no need of a coherent language. But with the induction of a new power into the animal frame called Soul, by virtue of which the atoms of the animal brain were compelled to assume higher aggregations, improved language became a necessity, and the organs of speech became modified accordingly. In the Brute the aims of existence seem to be the maintenance of life and the propagation of the species, and for the fulfiillment of these ends incoherent sounds, by means of which they convey to their offspring or companions the discovery of food or the presence of danger, answer the ends to be attained.

The undeveloped condition of rational speech among the lowest savages furnishes evidence of its possible evolution from brute beginnings. Among many of them the poverty of language is such that it cannot convey ideas of a highly abstract nature. Thus, may tribes have no definite ideas of numbers above ten or twenty, and their notion of these is derived from the number of fingers and toes they possess. Numerous citations might be made from the narratives of modern travelers, which go to show that there are many savage tribes whose language is as rudimentary as we can conceive it to be in a rational being. Thus, Galton, in his account of the Damaras, says: "They puzzle very much after five in counting, because no spare hand remains to grasp and secure the fingers that are required for units. Yet they seldom lose oxen; the way in which they discover the loss of one is not by the number of the herd being diminished, but by the absence of a face they know." Among the Brazilian Indians, Spix and Martins tell us that they have no words for such abstract notions as plant, animal, color, tone, sex, species, &c.

It is a significant fact that in the vocabulary of the savage there is a notable absence of all words which indicate development of the moral sentiments, whilst words expressive of violence and the brute passions are comparatively numerous. Do we not observe the same thing among the lowest orders of our own social state?

Turning to the historical evidence of the evolution of language, we find the testimony overwhelming. Nothing is more mutable than language, and the changes constantly in progress are radical and universal. There is not a language existing to-day that was spoken a thousand years ago. In the modern French, Spanish, and Italian we may trace the remains of their Roman and Gothic ancestry, and the English language of to-day bears but a faint resemblance to the old Anglo-Saxon. And so it has been with all language whatsoever; birth and death, growth and decay, are as conspicuously evident in the history of languages as in the history of nations.

Sanskrit, Hebrew, Greek, Latin, &c., to which modern civilization owes so much, have long since perished, and their remains offer to the Philologist the same interest that the fossil remains of the rocky strata of the earth furnish the Paleontologist. From

the one has been traced the origin of existing languages, and from the other the origin of existing life.

Says the eminent Philologist, Max Muller: "As sure as the six Roman dialects point to an original home of Italian shepherds on the seven hills at Rome, the Aryan languages together point to an earlier period of language, when the first ancestors of the Indians, the Persians, the Greeks, the Romans, the Slaves, the Celts, and the Germans were living together within the same inclosure, nay, under the same roof." He holds that in the most elevated table land of Central Asia there existed, in times far beyond the reach of history and tradition, a country to which he gives the name Aryana, and that from the language of this ancient nation have sprung the languages of Europe and Hindoostan.

Modern Philologers divide languages into three great Families: The Aryan or Indo-Germanic, the Semitic, and the Turanian.

Under the Aryan are classed the languages of Europe and India, and hence also called the Indo-European. Under the Semitic are embraced the Aramaic, Hebraic, and Arabic. Under the Turanian are included the Tungusic, Mongolic, Turic, Finnic, and Samoyedic in the North, and the Tamulic, Bhotiya, Taic, in the South. All language bears internal evidence of having had a common origin. Thus the researches of the philologer furnish arguments in favor of the unity of the human family, thereby corroborating the statements of Holy Writ and strengthening the theory of Evolution.

With this brief outline of the evolution of language, we will now turn to an equally brief survey of the development of the social functions.

The lowest savage communities present us with a state of things where the *complexity* of the social functions is such that, as yet, there is no division of labor, the duties of every man of the tribe being the same as every other. Thus, they are all warriors, all huntsmen, and all are equally skillful in the manufacture of clothing and implements of warfare and in the building of houses and canoes. Every part of the social organism is equally adapted for the performance of its various functions. As civilization advances, skilled labor arises, and different individuals are selected to perform different occupations. Thus, one man may have proved himself the most skillful house-builder, another a canoe-builder, another a weapon-maker, and so on through the various occupations.

As greater progress is made, new vocations are developed, and more specialists arise. This differentiation of society grows with its growth, and becomes more and more conspicuous as civilization advances. Compare a village community of the United States with a village community of South Africa, and what a contrast is offered us! In the civilized community we will find at least one, and most likely several, representatives of the various occupations which distinguish the highest civilization: A priest, physician, lawyer, banker, druggist, dry-goods merchant, grocer, shoemaker, blacksmith, carpenter, mason, miller, photographer, tailor, house-builder, carriage-maker. Besides these diverse occupations there will be numerous others less conspicuous, but all serving some useful end to the society as a whole.

In the savage community will be found a Medicine Man, who will probably unite in himself the offices of priest, physician, and chief of the tribe; we may also find some few who are rather more skillful than their fellows in the making of canoes and weapons, and some who are more noted as warriors or huntsmen. The tremendous impetus which the arts and sciences have given to individual pursuits has brought about a specialization of function in modern society of which our ancestors, two hundred years ago, could not have so much as dreamed. This specialization or division of labor is nowhere better illustrated than in the history of the healing art. In early times the medical man, who was also a priest, was the sole depositary of all the sciences; and this is proved by the fact that the word *Phusikos* came to be used at an early date among the Greeks to designate those who professed to heal the sick. This word, from which our own word Physician is derived, signifies a *student of nature*, (from *Phusis*, nature,) and has no reference to the possession of healing power. Among the early Greeks, therefore, the student of nature and the medical man were always united in the same person. We have already seen that among existing savages this is universally the case. He who became a physician or student of nature had in view, as the principal object of such study, the power of curing disease and relieving suffering. In an early state of society the knowledge that cannot be made to subserve some useful purpose is not esteemed; hence the early students of nature chiefly prized that knowledge which could ameliorate the physical condition of their fellows, and he

whose stores of information enabled him to cure sickness and relieve pain, justly looked upon himself as having attained the most exalted object in life.

With the advance of civilization, feelings of æstheticism gradually develop, and knowledge in time begins to be prized purely for its own sake, independent of the practical uses to which it can be put. There would now gradually arise a few individuals whose time was not entirely devoted to the practical ends of healing the sick, and the number of such would increase with the growth of society; and this would continue until there arose a class who cultivated the sciences, distinct from the professors of the healing art. But this distinct class has always been extremely small until comparatively recent times; and, even now, the vast majority of the purely scientific men are drawn directly from the ranks of the medical profession.

But, besides these who have received a medical education, there are numerous others, in no way identified with the profession, who cultivate every branch of natural science. Two hundred years ago an intimate acquaintance with Physics, Chemistry, Botany, and Zoology was of comparatively rare occurrence beyond the ranks of the medical profession. Now every one of these branches are cultivated individually by men who have no knowledge of the other branches of medicine. This specialization of the maternal trunk has been carried still further, and every organ or system of organs in the human body is represented by specialists who almost ignore the study of diseases that may afflict the rest of the body. Thus, we have specialists of the nervous system, heart, lungs, liver, urinary organs, eye, ear, throat, skin, &c.

The application of science to the arts has caused a differentiation in industrial pursuits of all kinds which is even appreciable from year to year. This specialization of function is characteristic of the highest mass civilization. Through its means the wealth of the ages has been accumulated, to which new wealth is being added day by day. Civilization is unfolding more and more the capabilities of the race as a whole, and who will be so bold as to mark the limits of its growth? Evolution has *simplified* the *complex* constitution of embryo humanity, and this simplification will continue as the race advances in civilization.

Section IV.

Development of Governmental Institutions.

General reference has already been made to the growth of government, and we saw that the nucleus of the social organism was the family from which the tribe arose, and that a union of these constituted the nation. It was also shown that when the family relation was well established, patriarchal government is the form we would naturally expect to find, and that it would subsist until aggregation of families into tribes began to take place, when the patriarchal would give way to chieftainship, at first elective and then hereditary; consolidation of tribes into nations would be followed by a regal or imperial rule. The patriarchal form of government is well illustrated by some of the early civilizations of the Biblical record. Among existing savages traces may be found in the headless tribes, where there is no regular chief, the head of each family occupying an independent position of every other. In tribal government the power of the chief, whether elective or hereditary, would be limited or directed by a council consisting of the old men. In this assembly would be discussed all important affairs concerning the common weal. The execution of the plans so determined upon would be entrusted to the chief, assisted, it may be, by several subordinates.

This is the form of government among most savages at the present time. The power which the chief exercised would depend largely upon his individuality, and his personal influence might be such that, at times, he would exercise almost absolute authority. But such personal ascendancy would be of short duration among savages, being everywhere checked by that restlessness under restraint which is common to the lowest as well as to the highest developed intelligence.

We therefore find *Limited* government to be as much the characteristic of the savage as of the more highly civilized nations. The intermediate form of Despotism is only possible after considerable advance has been made beyond the savage state, and after class distinctions have arisen; and this presupposes previous aggregation of tribes by conquest, and the reduction of the conquered to the condition of slaves.

War has been the furnace which has supplied the plastic mate-

rials from which the nations have been molded; and this, to a limited degree, still continues to be the case. But brute force is everywhere giving way before the superior might of intellect, and reason now accomplishes what the sword did in more barbarous ages.

It has already been shown that, originally, man must have been exclusively vegetarian in his diet, and that he only acquired his taste for flesh after considerable progress had been made.

Increase of population would rapidly encroach upon the supply of vegetable food, and this would necessitate migrations to other fields. But, in course of time, these, too, would be exhausted, and new regions would have to be sought. The pressure of population upon the means of subsistence would at last reach a point when other kinds of food, other than vegetables, would have to be resorted to in order to stave off hunger; and man gradually came to be a flesh-eater.

As this habit became confirmed, the *Hunting* Stage of Man's existence was inaugurated; and his nomadic tendencies, which were previously limited to those territories which furnished a natural supply of vegetable food, now reached greater development. It was doubtless during this Hunting stage that the great geographical distribution of the race took place. As he receded further and further from the warm cradle of his infancy, led on by the pursuit of game, the necessity of clothing to protect his naked body from the cold blasts of a less genial clime would force itself more and more upon him, and he would thus learn to throw over his bare shoulders the skins of the wild beasts he had slain for food. It is highly probable, therefore, that primitive man first began to wear clothing after he had migrated from the country of his birth. The necessity of some kind of shelter would also force itself upon his dawning intelligence. Natural caverns would first supply this want, and the remains of the cave dwellers of Europe bear witness of this period of his life. From these natural shelters to a rude hut of mud, stone, or timber, covered with skins, would be but a short step.

The discovery of fire and the manufacturing of weapons to assist in taking game were immense strides. The earliest civilization which prehistoric researches have brought to light shows that man was already possessed of *fire* and *flint* weapons, and a

rude kind of pottery. Of all the discoveries made by man, after the development of language, that of Fire must be given the first place, for without it all further advance would have been impossible, and he would never have emerged from his primitive state.

How this great discovery was made is, of course, but a matter for conjecture. The most popular theory is that it was first obtained by friction between two sticks; but, when we consider the difficulty attending this process, the theory is a doubtful one. Natural fires induced by lightning or the presence of a volcano seems to be a more plausible explanation. Its principle quality, that of giving warmth, would soon become familiar to the savage mind, and engender the desire to reproduce it on special occasions when exposed to intense cold. In making his flint tools, the sparks emitted might suggest the possibility that they were kindred in nature to the natural fire he had witnessed, and this recognition would be followed by an attempt to ignite inflammable material by the spark. The production of fire by friction, so universal among savages, was probably discovered at a later date. The preparation of flesh by heat was another great step, and this, too, was doubtless an accidental discovery, somewhat after the manner of Charles Lamb's "roast pig."

Familiarity with the animal world, which his hunting life occasioned, and the difficulty of always supplying himself with sufficient food, would teach him the wisdom of endeavoring to domesticate the tamer animals for purposes of food in times of dearth. When this custom was firmly established, the Pastoral stage of development was inaugurated. The possession of flocks and herds tended to lessen their nomadic habits, for, being assured of food, the necessity for being constantly on the go in pursuit of roving game would no longer arise.

Their migrations would now be guided by the supply of food for the herds, and this would naturally lead them to those fertile regions were rich pastures prevail. Once established in such a favorable spot, where the bounty of nature supplied every want, they could not but contrast its great advantages over the comparatively barren regions from which they came. Their migrations would, therefore, in all probability come to an end, and what was intended, originally, as a temporary abode, would become a fixed home.

In course of time the tent of skins, a necessity of their former mode of life, would be supplanted by more permanent and commodious shelters of sun-dried brick, stone, or timber. A fixed home in a fertile country would encourage experiments in planting, and a rude tillage of the soil would gradually arise in connection with herd-keeping. And now the *Agricultural* stage of development was entered upon, and progress became rapid. That native ferocity of character inherited from brutish ancestors, and which had been mitigated, in some degree, by the pastoral life, was now further softened, thereby fitting man more and more for domestic intercourse, and the exercise of the peaceful arts. The germs of true civilization now began to develop. The testimony furnished by history as to the seat of the first great civilizations confirms the deductions above reached. The fertile basins of the Nile and the Euphrates, and the broad plains of India and China, offered rich pastures for the nomadic tribes of central Asia, and became so many nurseries. From these points as centers, the germs of civilization have been disseminated over the world.

But this dissemination was not effected so much by the quiet intercourse of peace as by the storms of war; and a brief sketch will enable us to form some notion how these small agricultural communities, and nurseries of civilization, developed into the mighty empires which the dawn of history offers for our contemplation.

The civilizations of the Egyptians, Chaldeans, Hindoos, and Chinese break upon us suddenly from out the past, presenting us with arts, sciences, a numerous priesthood, elaborate religious ceremonies, a highly developed centralized government, established castes among the people, and stupendous public works. Authentic history commences with all these evidences of a high state of civilization, but how the several nations referred to attained to this wonderful development, history is silent. The Biblical records, the oldest writings which have come down to us, merely make bare statements, without attempting to trace the path of progress. That these civilizations shot up fully grown, we are not warranted in believing, nor are the writings of Scripture to be so interpreted.

In attempting to pierce the veil which conceals the events of prehistoric times from those of authentic history, we must call to our assistance the events which this authentic history supplies, and

these, in connection with the deductions of reason, may enable us to give a rational explanation of the rise of those great empires which stand out so conspicuously above the horizon of the past.

The task before us, then, is to give a rational answer to each of the following questions:

Were the great civilizations above referred to the result of a gradual development of the *original* inhabitants of these favored regions undisturbed by conquest? Was the absolute despotism which characterized their government, one and all, merely the consequence of gradual usurpation of power by the patriarchal chief, who originally ruled with the assistance of a council of elders? How arose that division into castes which universally distinguished them? Industrial pursuits, of which tillage of the soil is literally the ground-work and the chief, can only flourish in a peaceful community, and their exercise tends to tone down the war-like spirit, supplanting the ferocity which carnage engenders by the love of ease and tranquility. Progress in the arts of peace would thus be gained, but it would be at the sacrifice of the desire and ability to carry on war. It is the characteristic of a low civilization that the people are either very gentle and peace-loving or very ferocious and fond of war; and the arts of peace and the arts of war in such a community can never be developed at one and the same time—one is always sacrificed to the other. Hence these early agricultural settlements would in time lose both the spirit and capacity to carry on war, all their energies being devoted to developing those arts which tended to ameliorate their physical condition. A half-savage community so circumstanced would fall an easy prey to any nomadic and war-like tribe that might attack it. Subjugation would be complete, and the conquerors, taking possession of the territory, would reduce the conquered to the condition of slaves. The arts which the original people had discovered would be quickly adopted by the conquerors, and possibly the customs and manners of the conquered might in a measure become engrafted on their own. The elements of social distinctions would now be furnished; the conquerors would supply the ruling class, while the conquered would furnish the lower or laboring class.

The priest class of the conquered community, being the depositaries of all knowledge, would soon gain an ascendancy over their

more ignorant and superstitious conquerors, and from being numbered among the ruled it would not be long ere they recovered their pristine authority with, it may be, increased power. A long continued peace would in time convert the conquerors into an effeminate race, but the peaceful arts would be brought to still higher perfection during the period of tranquility. The appearance of another marauding band of war-like shepherds would again result in the subjugation of the country and the entire or partial enslavement of its inhabitants. But the priesthood, at first debased, would soon recover their ascendancy with new accessions of power.

The new blood and energy brought in by every new conquest, and the subsequent period of peace, would carry civilization higher and higher, and eventually culminate in the establishment of national organizations similar to those that greet us at the dawn of history in the valleys of the Nile and Euphrates and on the plains of India and China, and, in recent times, which existed in Peru and Mexico, and still exists, measurably, in Japan. The distinction of castes, already referred to as being one of the chief characteristics of all the very early civilizations, finds a most plausible explanation on the hypothesis of repeated conquests and the permanent occupancy of the country by the conquerors.

In early Egypt, Persia, and India four distinct castes were to be met with. The *first* and highest was the Priesthood; *second*, the Military class; *third*, the Husbandmen and Merchants; *fourth*, the Sudra or Serfs. In India there existed a class even below the Sudra or Serf caste, called Pariahs, who were the very dregs of the population and universally contemned and trodden upon. According to Hindoo tradition, the Brahmin or Priest caste sprang originally from the head of Brahma, and to them were assigned the duties of teaching and sacrificing and all the offices of religion. They were regarded with the most sacred veneration and looked upon as the most exalted of men, foreign kings being infinitely beneath the meanest Brahmin. The least disrespect shown to one of the sacred order was punishable as an atrocious crime.

The military class sprang from the arm of Brahma and the agricultural and mercantile from his thigh. The Sudra proceeded from his foot, and their chief duty consisted in serving the other three clases. They were not permitted to read the sacred books,

nor were they instructed in any of the rites of religion. The Sudra was not allowed to amass wealth, and all his goods, as well as himself, were the property of his master. He was on no account permitted to better his condition nor aspire above the caste in in which he was born. But his state, with all its disadvantages, was still infinitely above that of the Pariah, who was regarded as the outcast of society and treated with less consideration than the brutes of the field.

Such a condition of things could never have arisen except through successive conquests, and this inference as to the events of pre-historic times is strengthened by the occurrences which have taken place since history began to unroll her pages for our inspection. Those pages are little more than chronicles of violence and bloodshed; a never-ending cycle of conquest and enslavement, where the conquerors of to-day became the conquered of to-morrow.

A characteristic feature of these early conquests, and one which is so conspicuous that it cannot fail to attract the notice of the historical student, is that, generally, the conquered nation is more highly civilized than their conquerors. The arts and sciences, manners and customs of the conquered, though partially eclipsed for the time by the storms of war, soon revive and are adopted by the rude conquerors, who are thereby softened and elevated.

This course of events, which was almost universal in early times when the process of nation-making was in its infancy, was reversed when civilization attained to a higher degree of development; for the arts and sciences, which had previously been exclusively engaged in lifting man from a savage condition, were now used to perfect the art of war, and a nation would thus come to excel both in the arts of peace and the practice of war. Such a nation, therefore, *reversing the obligation*, would carry its higher civilization to the conquered.

The obligations incurred by the conquerors of the early period of the world have been and are being paid back by the conquerors of modern times. The savage of to-day, pitted against a civilized nation, must either become elevated or undergo extermination. But the dawn of history furnishes us with quite different pictures. We behold Egypt, the mother of civilization, overrun by a horde of rude shepherds from the wilds of Ethiopia and Abyssinia and her lands partitioned among them. *How often* the same thing had

occurred previous to this first record of history we can only conjecture. The civilization of the Tigro-Euphrates basin, which probably took its rise nearly about the same time with that of the Nile valley, was subjected to the same inroads of more barbarous and war-like neighbors. The conquest of this region by Nimrod (2200 B. C., about) is the first which history records.

According to the Bible, this Nimrod was a "mighty hunter," and founded many cities. There is no doubt that he belonged to that nomadic people of half hunters and half shepherds that must have, at this time, completely overrun the high central parts of Asia. The infant agricultural civilization which had arisen in the rich valley of the Euphrates would fall an easy conquest to such a war-like band of shepherds. In all probability the country had been overrun many times before Nimrod established his Empire.* The Biblical record informs us that the successors of Nimrod were overthrown by the Elamites under Chedorlaomer. From the establishment of the Elamitic dynasty to the next conquest is a blank of about 700 years, during which many different conquests doubtless occurred. About this time the country was again overrun, and the reigning dynasty was replaced by another herd of shepherds from the Arabian plains, and after about 245 years these gave place to another horde of Assyrians.

That the early agricultural settlements of China were subjected to the same inroads of wandering shepherds from the high tableland of Asia is sufficiently shown by the existence of the great wall, which was begun about 300 B. C. How often the country had been overrun prior to this date the Chinese chronicles give no account; but the notion of undertaking such a stupendous work, which has no equal in ancient or modern times, would not have presented itself to the minds of the people had not its necessity been demonstrated by the previous history of the country. Indeed, China may be regarded as the vast receptacle which has received and civilized the barbarous hordes of Tartary from time immemorial. As soon as population pressed upon the means of subsistence, which would occur at intervals, through the wearing

* According to profane history, Babylon was founded by Belus, who is supposed to be the same with Nimrod, 2100 B. C. His son Ninus succeeded him, and either founded or enlarged Ninevah. Semiramis, his queen, added much to the splendor of the two cities.

out of pasture lands, these hordes would swoop down upon the fertile plains of China, and would, in time, become amalgamated with the conquered race. As late as the thirteenth century, we behold a nomadic Tartar chief, Gengis Khan, uniting the wandering shepherd tribes of central Asia, and carrying his arms to the heart of China. The conquest which he initiated was completed by Kublai, and the Tartar dynasty so founded gave nine successive Emperors to China. In the year 1357, a revolution occurred which overthrew the Tartars, and seated the former dynasty on the throne. This subsisted for 276 years, and was again overthrown (1641) by a horde of Mantchoo Tartars, and this dynasty still retain the throne.

All the conquests above referred to were universally made by a barbarous and rude people over one of a much higher civilization. As further illustrations of this truth may be cited the conquest of the Grecian States by their comparatively rude neighbors, the Macedonians. Barbarous and war-like Rome now gradually arose on the horizon, and soon enveloped the higher Grecian civilization in its dark folds. The philosophy, literature, and art of the conquered brought with them the inevitable decline of the war-like spirit, and Rome, the mistress of the world, soon became a prey to the barbarous hordes she had so often conquered. Rome, during the height of her military prosperity, both received and gave a higher civilization—from Greece she received; upon Gaul, Germany, and Briton, she conferred.

To the repeated inroads of the northern nations she finally succumbed; and the civilization which they received, in turn made them an easy prey to the successive hordes which swept over Europe from the plains of Asia.

Among the first early conquests recorded by history, in which the conquerors were the more highly civilized race, are the Phœnecian settlements in Greece and other points on the Mediterranean. The first Phœnecian colony, under Cecrops, is said to have landed on the shores of Greece about the year 1500 B. C. The original inhabitants were, in time, reduced to slavery. As the human race advanced, the instances where the conquerors carried to the conquered a higher state of civilization than they found became more and more frequent. Thus the career of nearly all people shows us that the obligations they incurred, in their earlier history, to a

more civilized nation, are paid back, at a later period, to a less highly civilized one.

Sufficient evidence has been adduced to show beyond all doubt that in the very early civilizations, and the earlier the truer it becomes, the *conquered* races have generally been the *civilizers;* and this truth, which we were led to infer, has received positive proof from the records of history. But in modern times the obligation is all one way; a savage nation can no longer cope with a civilized one, and the conquerors always take with them a higher state of things than they found.

Why is it that at one period of the world's history its *highest civilization* is less able to defend itself against more barbarous neighbors than at a much later period? It might, at first, be inferred that no matter what might be the *absolute* height of a civilization, it would insure its possessors against the attacks of those who possessed an *inferior* one. The explanation of this apparent paradox has already been touched upon. In the early stages of human development the first use to which knowledge is put is to ameliorate the physical condition. Thus, the war-like ferocity which is common to man in his hunting and shepherd state becomes mitigated as soon as he enters upon an agricultural life. His knowledge is as yet too rudimentary to enable him to make much improvement on the weapons of his earlier state, and without improved weapons his physical ability to carry on war is no greater than his more barbarous neighbors, while, at the same time, he has lost the ferocious spirit which they still retain; thus he is no longer their equal in the field. But, as civilization advances, the sciences which are discovered lend their aid in developing the art of war, and new and more powerful instruments of destruction are invented which enable a less war-like nation to contend successfully against a more ferocious and less civilized antagonist. The application of the science of chemistry and the mechanical arts has so improved the methods of killing that the human race would soon be exterminated from off the face of the earth were the war-like spirit comparable to what it was in former ages of the world. Had the breech-loading rifle and the Gatling gun been known in the middle ages, Europe would have soon been converted into a howling wilderness, such was the ferocity of that barbarous period.

An old chronicler, describing the state of France about the be-

ginning of the fifteenth century, says: "In sooth, the estate of France was then most miserable. There appeared nothing but a horrible face, confusion, poverty, desolation, solitarinesse, and feare. The lean and bare laborers in the country did terrifie even theeves themselves, who had nothing left them to spoile but the carkasses of these poore miserable creatures, wandering up and down like ghostes drawne out of their graves. * * * * All men-of-war were well agreed to spoile the countryman and merchant. Even the cattell, accustomed to the larame bell, the signe of the enemy's approach, would run home of themselves without any guide by this accustomed misery."

The numerous castellated structures perched on commanding heights, the remains of which are still to be seen throughout Europe, adding an air of romance to the landscape, were the abode of professional cut-throats, whose pastime was murder and rapine. Such was the lawless state of the times that industrial communities were compelled to band together for mutual protection; and the celebrated league of the Hans towns, which did so much for the civilization of Europe, was the result.

In tracing the decline of the war-like spirit among men we may recognize four chief causes:

1. The softening and elevating influence of the Christian religion.

2. The invention of gun-powder, and its application to the art of war.

3. The invention of printing, and the consequent diffusion of knowledge.

4. The application of steam to locomotion, which brought about freer intercourse among the nations, removing ancient prejudices, and binding men together by the ties of self-interest.

Before the invention of fire-arms, every man was a soldier, and subject to be called upon at any time to dip his hand in the blood of his fellows. Development of the methods of war necessitated more training on the part of the soldier, and standing armies gradually arose. The mass of the people thus became separate from the military class, and could devote more of their time to peaceful pursuits. The diffusion of knowledge, brought about by the printing press, increased the number of the intellectual classes; whilst the advantages of commercial intercourse, encouraged by

the improved methods of locomotion, became more and more apparent. All these causes together rapidly increased the number of those who were interested in maintaining peace.

War is the chief occupation of the semi-civilized; hence, all early government tends to assume the *centralized* or militant type. Among the savages, where there is no established polity, and in whom there is an innate love of freedom and impatience under control, this centralization of power rarely, if ever, takes place, and if it should arise on special occasions, it is always of short duration. But among the semi-civilized centralization of power has always been the rule. The militant type of government, as Mr. Spencer well says, "is one in which the army is the nation mobilized, while the nation is the quiescent army, and which, therefore, acquires a structure common to army and nation."

"Centralized control is the primary trait acquired by every body of fighting men, be it horde of savages, group of brigands, or mass of soldiers. And this centralized control, necessitated during war, characterizes the government during peace. Among the uncivilized there is a marked tendency for the military chief to become also the political head, (the Medicine Man being his only competitor;) and in a conquering race of savages this political headship becomes fixed. Among semi-civilized the conquering commander and the despotic king are the same; and they remain the same among the civilized down to late times." Thus the comparatively free and limited government of the savage gives place to the centralization and despotism of the semi-civilized.

The great empires of early times, Egyptian, Babalonian, Assyrian, and, later on, the Macedonian and Roman, were all of this type. At the present day the same system of things exists among some of the principal nations, with this difference, however, that in very early times the Despot was chief of the Priesthood, and frequently exercised religious offices. Plato, referring to the dignity and importance attached to the sacerdotal office, says:* "For the figure of priests and prophets is replete with prudence, and obtains a reputation for respect through the greatness of the matters in their hands; so that in Egypt it is not permitted for a king to govern without the sacerdotal science; *and should any one previously of another genus of men become by violence king, he is after-*

*The guest in "The Statesman," translated by Burges.

wards compelled to be initiated in the mysteries of this genus. Further still, among the Greeks, one may find in many places that the greatest sacrifices relating to matters of this kind are imposed upon the greatest offices; and what I assert is shown particularly among you. For to him who is chosen by lot the king here, they say that of all the ancient sacrifices those held in the highest veneration and most peculiar to the country are assigned."*

It is true that the present Emperor of Russia is the head of the church, but he in no sense considers himself a priest nor does he exercise religious offices. The dukes of Muscovey *originally* held their temporal authority at the hands of the Patriarch. But the temporal ruler gradually usurped independent power and finally assumed the nominal headship of the church itself. The bloody Henry VIII, in throwing off his allegiance to the Pope of Rome, established the English church, arrogating to himself its headship; and the constitution of the free government of England still remains encumbered with the humiliating declaration that the sovereign is the head of the church. How this relic of barbarism has been allowed to remain so long on the statute-books of a nation where there is so much enlightened thought, is one of the many extraordinary anomalies which the English constitution presents.

Democratic independence characterizes human institutions in the first as well as in the latest and highest stages of their development. *At both ends of the chain of human progress we behold absolute freedom*, and all the forms which government has assumed between these extremes of civilization represent the steps taken in its upward course of development. But the freedom of the primitive man differs from the freedom of the civilized man in this very important feature: the freedom of the one is the freedom of the brute and springs from ignorance; the freedom of the other is the assertion of the dignity of the individual, and springs from the highest enlightenment. The primitive man has no community of action with his fellows, and with him there is no government; whereas, in the civilized man, community of action is insured by an established constitution, and government is brought to its highest state of perfection.

The following table will convey a general idea of the progressive

* The second *archon* at Athens was called the *king*, and had cognizance over the principal religious festivals.

steps which the race has taken in its onward course of development up to the present time, commencing with the *lowest conceivable* state of Primitive Man:

I. Self Rule. (Solitary life; family life not yet well established.)	Family relations not yet well established. No recognition of Paternal authority. Maternal authority in force until the offspring is able to care for itself, after which all relation ceases. Of this condition of the race no examples remain. This very primitive man is extinct.
II. Absolute Rule. (Family life.)	Paternal government; in which the Father exercises absolute authority over his children, which continues, in the lowest man, until the children establish families of their own. In its higher developed state the authority of the Father remains in force as long as he lives. The patriarchal rulers of the Bible are of this type. Some African and Australian savages, and some Esquimaux, furnish illustrations of the first phase of this form of government.
III. Limited Rule. (Tribal life.)	Elective or hereditary chieftainship, aided by a council of elders. No written constitution nor fixed laws. Governmental action entirely guided by the needs of the passing moment, and determined upon in general council, presided over by the chief. The authority of the chief will depend upon his individuality. If he be Medicine Man it will probably be absolute, though of uncertain tenure. Examples—Savage tribes generally in all ages and places. The patriarchal chieftainships of the hunting and shepherd states of early and existing times. Some phases of the early Greek states and early Rome. The Gauls, Germans, Saxon heptarchies and Caledonian clans, &c., &c.

IV. Absolute Rule. (National life.)	National existence. Numerous tribes aggregated together into a coherent mass, forming a nation, ruled by a Despot, (priestly or militant,) whose Individual Will is the Supreme Law. Examples—The Early Empires of Egypt, Babylonia, Assyria, Persia, Macedonia, Rome. Among existing nations, Russia, China, Japan, Turkey, &c.
V. Limited Rule. (National life.)	National existence. Highly evolved system of Government, and a written constitution. Will of the Ruler (entitled Emperor, King, or President) guided or modified by a representative council of the nation. Examples—Some phases of Rome and Grecian states. Oligarchies or Republics of Italy in middle ages. Among existing nations, Germany, Austria, Italy, Spain, England, and the centralized republic of France. England, though a monarchy, has passed beyond the militant type of government, whilst France, though a Republic, is still essentially militant in type.
VI. Self Rule. (National life.)	National existence. Highly Evolved system of government, and elaborate written constitution. The Chief Magistrate, (entitled President,) a recognized Servant of the people, executing their will in Congress assembled. No privileged classes, and the right of suffrage is universal. Example—The United States of North America is the purest and most conspicuous example of this form of government.

The object of the above table being to condense in as small a space as possible only salient features it is necessarily very incomplete, and *transitions* and *relapses* are not brought out; but that it is a faithful representation of human progress in general no just thinker can deny. The citizen of the great Republic may, with

pardonable pride, look upon its institutions as the highest expression to which government has yet attained.

At the opening of history, Athens and Lacedæmon were ruled by despots as absolute as any Persian Monarch, but, on the death of Codrus, about 1068 B. C., a reform in the government was instituted, and the so-called Athenian republic came into existence. They abolished the title of king, while the magistrate whom they put in his place had almost the same authority. They appointed Medon, son of Codrus, chief magistrate, with the title of *Archon*, or Ruler, and conferred on him the office for life, and even continued it hereditary in his family. The Republic was governed for 331 years by a succession of perpetual Archons of the family of Medon. The government was really a monarchy without the name, and became in the end as irksome to the liberties of the people. The perpetual archonship was then abolished, and the office limited to ten years. But even this was found obnoxious to the democratic feelings of the people. A Supreme Council of *Nine* magistrates was now appointed, to be newly elected every year. Of these the *First* was called by way of preëminence *The Archon*, and gave his name to the current year in the state annals. The *Second* Archon had the title of Basileus, (king,) and was at the head of religious affairs; the *Third* was called the Polemarch, and presided over military operations. The remaining *six* archons were termed *Thesmothetai*, and held the office of judges. The whole body of *nine* formed the Supreme Council. But troubles again arose, and the affairs of the country were once more thrown into confusion. Draco, whose great virtues had raised him to the dignity of chief archon, now attempted a settlement of the country. He abridged the authority of the *Areopagus*, and established a new tribunal termed *Ephetai*. But they proved of short duration, and the country was once more given up to anarchy, which, as usual, ended in the establishment of a tyranny. About the year 594 B. C., Solon, a lineal descendant of Codrus, was unanimously elected chief archon, and intrusted with the power to reform the government. He divided all the citizens into *four* classes. In the first *three* were the richer citizens, and from these all the offices of state were supplied. The *fourth*, much more numerous than the other three together, had the right of suffrage in the public assemblies. All affairs of importance concerning the state were

debated in these public meetings, and every citizen above the age of fifty possessed the right of speaking. Laws were made, war declared, and peace made in these assemblies; and such was the superiority of the popular vote, that the supreme power became vested in the masses of the people. This was found to have its disadvantages, and, to lessen the difficulties of enacting laws and determining important affairs of state, Solon established a *Senate*, consisting of four hundred members, appointed from the most respectable of the citizens. This body acted as a check upon the popular meetings, and no measure could be placed before them ere they had been canvassed by the Senate. As a further check upon the popular assemblies, he re-instated the authority of the Areopagus. To this body was intrusted, besides other important duties, the care of the public treasury, and all expenditures were determined by them. History tells us that about this time the number of citizens of the Athenian republic did not reach 20,000. The remainder of the population consisted of slaves, of which there were 400,000, and women and children. The slaves were either the descendants of the original inhabitants or the victims of subsequent wars and conquests.

Such is a brief review of the Athenian government from the earliest times down to the days of Solon. It will be seen that during this period every form of government had been tried. A similar condition of things existed in the other Grecian states and at Rome, and passed through about the same phases. The consolidation of the Grecian states under Philip initiated national despotism, and the same took place in Rome under Augustus.

In glancing over the foregoing table, it may be objected that France, being a republic, should not be classed with Germany, which borders on a Despotism. Yet the government which prevails in France to-day, notwithstanding the name of Republic, resembles that of Germany more than that of the United States. France is a centralized, military republic, and the system of things which exists there to-day would not be supported in the United States twenty-four hours. In assuming the name of Republic, with an elective chief magistrate, she has still retained much of the centralized machinery of Imperial rule; and the surveillance to which the individual is subjected is nearly as great as under the Empire. There is to-day more individual freedom in England

than there is in France, though the one bears the title of Monarchy, and the other that of Republic.

The state of affairs in France is the result of convulsion, and true Republican forms have not had time to supplant what was left of the Empire. The hostile attitude of neighboring nations has, in a measure, compelled her to retain the militant type.

The government of England is the result of gradual growth, in which the power of the people has steadily asserted itself, and encroached more and more upon the prerogatives of the Crown. It presents us, therefore, with a very peculiar state of things—with a monarch who reigns, but who does not rule; with an *upper* and *lower* legislative body, of which the upper is *inferior* to the lower. Indeed, the House of Lords clearly recognizes the fact that its very existence depends upon its good behavior and acquiescence in all measures insisted upon by the Commons. The perpetuity of the throne itself rests upon the same quiescent attitude; and any attempt to extend its prerogatives, or even to assert, in full measure, those allowed in the written constitution, would be speedily followed by its abolition.

In England the government has outgrown its name, and a republic might now be established without the shedding of a drop of blood. The chrysalis still remains attached to the fully developed insect, but these slender threads will soon be sundered, and the new republic will rise on its glittering wings to higher regions of development. The abolition of primogeniture and all titles would result in a natural collapse of the privileged class, and this would lead by easy steps to the setting aside of the throne, without confusion or turmoil of any kind. The present incumbent will, no doubt, be permitted to retain the shadow of royalty, but her grandson will never, in all probability, sit upon an English throne.

But democratic institutions will never succeed until the individual components of the nation have reached that state of development when they can govern themselves. A two-edged sword in the hands of a child would not be more dangerous to its life than self-government to those unprepared for it.

To insure this high degree of enlightenment general education must be insisted upon, and every possible encouragement given

to the diffusion of healthy knowledge among the masses.* Good citizens are the only safeguards of Republican institutions, and when they become apostates to their own high interests democracy must give place to Despotism; if a man cannot govern himself, another must perform that office for him. The early republics were perpetually running from one extreme to another. Anarchy and Despotism share between them a greater part of Grecian and Roman story; and such must inevitably be the fate of every nation in which the majority of the people are not civilized up to self-government.

Despotic institutions may be likened to an arch, while a Republic may be compared with a pyramid; the first is held together by a power from above, the second is supported by strength from below; the first is in a perpetual condition of unstable equilibrium, for the dislodgment of the keystone precipitates the whole in ruins; the second is the *type* of stability, for each stone of its broad foundation lends its aid in supporting the superincumbent structure.

Republican institutions to be successful must be the result of high enlightenment and gradual growth and not of sudden establishment. The history of France, from the first republic to our own times, sufficiently demonstrates this.

In the past one hundred years she has passed through every possible form of government; from no government, but that of anarchy, to the pitiless heel of Despotism, and back again to license and lawlessness. Revolution and counter-revolution, plot and counter-plot; now at the mercy of bloody-handed communism, and now scourged by the iron rod of Imperialism; this distracted country has been alike an example and a warning, the shame and the glory of the civilized world. The first Republic, brought forth

* To the extraordinary development of Journalism must be attributed the wide diffusion of knowledge among us. The influence of the press for good cannot be exaggerated. Every citizen, above the plane of the absolute pauper, reads the daily newspapers and learns to weigh matters of state policy as well as affairs of mere local interest. So elevated is the general level of our people that it is not too much to say that any town of moderate size might furnish numerous individuals who could fill with credit the highest office in the gift of the people. Contrast this state of things with the condition of affairs in any European country. Italy contains a population of twenty-nine millions, and of this vast population but one million subscribe for the daily journals.

in blood and cradled in anarchy, merited its short-lived existence; the second, less sanguinary and foully betrayed, endured but a short time; the third, established, indeed, under gloomy circumstances, is now under trial, and we may cherish the hope that the trial will be a successful one, and that the ship of the third Republic, now well launched, is destined to a long and prosperous voyage. Much of the ballast which still weights her down will in time be thrown overboard, and its place supplied by that which will redound to the general good. The immense military armament with which she is encumbered, and which does so much to retard her progress, will eventually be disbanded and the energy which it represents turned into industrial channels, and an era of content and prosperity, hitherto unknown in her history, will be opened up. No true American who has in mind the traditions of 1776 will refuse the voice of sympathy to the nation which aided us in the hour of utmost need. Between the countrymen of La-Fayette and the countrymen of Washington there is an invisible bond which time cannot weaken; and in the noble statue of Liberty, the gift of the French people to the people of America, which is now in course of erection in the harbor of our chief commercial mart, we have a testimonial of its present strength and a pledge of its continuance.

Russia, Germany, Austria, and other European states, are now passing through a crisis, and the forces of arbitrary power and personal liberty are arraying themselves against one another. But who that has followed the growth of democratic institutions for the past three hundred years can doubt the issue of the contest?

The volcanic forces, birth of repression, which are now making themselves felt through the length and breadth of Europe, are but premonitions of the terrible catastrophe which is impending, and should serve as a warning to those who seek to crush out personal liberty by autocratic power. They should remember the fate of France, and take heed ere it be too late. The red specter of Nihilism, hideous compound of everything foul and unseemly, conceived in ignorance and superstition, brought forth by oppression and nurtured by Atheism, stalks abroad through Europe striking terror to the hearts of men.

The enormous military establishments of Europe are sucking the very life-blood of the nations, and hundreds of thousands of

able-bodied men who might be engaged in developing the material resources of their country are converted into non-producers, becoming so much dead weight upon the shoulders of those upon whom the burden of producing depends. But the injury, great as it is, does not stop here; these men, taken from the healthy influences of the home circle at a tender age, are exposed to all the demoralizing tendencies of a soldier's life, taught to look upon war as the noblest occupation, and to thirst after distinctions which are only to be purchased by the blood of their fellow-men. Under the specious names of honor and glory, the most brutal passions which can take possession of the human heart are set up and worshipped; and orders and decorations, the rewards of royal favor, pour in upon him whose deeds might cause the tears of the recording angel to flow. The justice of the cause, which is the only redeeming feature of war, is too often utterly ignored; and national aggrandizement and love of conquest actuate the rulers, while desire for personal distinction nerves the arm of the soldier.

All honor be to him who, to free his country from the foot of the invader or to redress the wrongs of the oppressed, "bares his bosom to the storm and rushes into the thickest of the Fight."

> "'Tis the cause makes all,
> Degrades or hallows courage in its fall."

Nothing so distinguishes the civilization of the United States, above that of all other nations, as the disrepute into which the military profession has fallen. It is subordinated, under all circumstances, to the civil authority. It is regarded as an instrument which Justice holds in readiness to assert her dignity, and mete out her decrees, but the instrument itself is made to feel that it is as much an evil as any other which Justice is sometimes compelled to use. It is a great deal for a nation to be able to say that love of peace is the predominant passion of its citizens, and that its rewards and distinctions are held in higher esteem than the so-called honors of war. With a power to shake the nations of the earth to their very foundations, were it disposed to conquest, this country possesses an armament just sufficient to police its thinly-settled regions, and hold in check a few wandering savages.

The United States, by her national strength, by her boundless physical resources, by the high state of general civilization induced by the wide diffusion of knowledge, and the noble spirit of inde-

pendence which her institutions foster, claims, as her just right, the van among the nations of the earth. She stands before the world a proud example of the possibility of self-government, and has demonstrated, beyond all doubt, that the race can only attain to its highest development under the nurturing discipline of self-rule.

The child requires the arbitrary rule of Parental authority, but as it grows in years and mental strength, the wise Parent relaxes, more and more, that absolute authority which he was at first compelled to exercise, and the child is taught the power of self-government as its capabilities increase; and, finally, when it attains to full manhood, the parent abdicates all authority, and recognizes in its offspring the right of entire self-control.

He who can seriously doubt that self-government is the only form under which the race can attain to its full development places at defiance the teachings of analogy as well as those of experience. "If there be any among us who would wish to dissolve this Union, or to change its Republican form, let them stand, undisturbed, as monuments of the safety with which error of opinion may be tolerated where reason is left free to combat it." *

The part which this nation is called upon to play, in furthering the progress of the race, is a grand one. But little over an hundred years have elapsed since she assumed national existence, and gave to the world, through the pen of her greatest statesman, that proclamation which will ever remain unique as the proudest declaration of the rights of man. Though young in years she is old in strength and wisdom. One of the high missions which this nation is called upon to fill, and for which her enormous strength so aptly adapts her, is the diffusion of the love of peace and its maintenance. Whilst the United States has virtually reduced its military establishment to a police force, it has not yet put the finishing stroke to its peace policy; so long as the names of army and navy remain, so long will they be stumbling-blocks in the path of her mission. As a defensive force, both by sea and by land, is an absolute national necessity, so long as external enemies exist, it remains for us to show to the world that this armament is nothing more than a national police from which the barbarous thirst for military renown has been entirely eliminated. Nor need we fear

* Thomas Jefferson.

that the entire abolition of this military spirit will tend, in any way, to destroy the efficiency of a national police in time of war; on the contrary, feelings of patriotism and a high sense of duty are more to be relied upon in the hour of emergency than the courage which is stimulated by the desire for personal distinction.

The spirit which supported our ancestors in the darkest hours of the Revolution was far different from that which swelled the huge hosts of Napoleon, and carried them to the frozen plains of Russia! We can well afford to let die feelings which are degrading to every enlightened and civilized nation. The most efficient man in times of war is not he who seeks amid the smoke and carnage of battle the blood-stained laurels of renown or the baton of command, but he who detests his occupation, and who is compelled thereto by high and pure motives, the defense of home and country.

The glitter and show thrown around the military profession among the nations of Europe are intended to keep alive the war-like spirit; but, in spite of all efforts to the contrary, it is rapidly disappearing. The collective wisdom of the race is too powerful to be overthrown by narrow and selfish rulers.

> "Old Might to Right is yielding, battle-blade to clerkly pen,
> Earth's monarchs are her peoples, and her serfs stand up as men."

The titles of army and navy should be abolished from among us. There is a great deal in names, and the associations which surround them. In the United States the public feeling against maintaining an army and navy is so great that these branches are in danger of extinction, and the country left without any national organization for defense in cases of emergency. But the feelings directed against the army and navy would have no place in the public mind where a national police was concerned. Congress would not hesitate to vote two millions for national defense where it now begrudges one for the maintenance of army and navy. Much of the useless machinery which now characterizes these latter organizations would, of course, be done away with, and the whole reduced to a more solid and efficient basis.

Section V.

Development of Religious and Moral Institutions.

The study of humanity, both in the past and in its existing savage states, shows us that the Religious sentiment *precedes* the development of ideas of *right living*, or Morality; and that the one stands toward the other in the relation of Parent and Child.

With the recognition of the existence of some Superior Being or Beings, religion commences; with the endeavor to guide personal conduct by the supposed wishes or commands of this Superior Being or Beings, morality is initiated. Morality, in Primitive Man or the Savage, is Practical Religion. The religious sentiment prompts to true worship, when based on gratitude for benefits received; to propitiation, when to appease anger or ward off evils.

As the fruit of religion is the moral sentiment, (*i. e.*, desire to please,) so the fruit of the moral sentiment is practical morality; and this pre-supposes a knowledge, or *supposed* knowledge, of the wishes of these Superior Beings. Such knowledge, or supposed knowledge, will be so vague, indefinite, and shifting, where there exist a multitude of such Superior Beings, that a definite moral standard can never be recognized, (as among savages generally;) but when these beings are fewer in number more distinct ideas of conduct will arise. The character of the standard will depend upon the conception of the nature of these Superior Beings; thus, the height and purity of a Moral Code will be commensurate with the height and purity of the religion which gave it birth.

No Savage people has yet been discovered in whom there is a total absence of the Religious sentiment, and some vague notions of proper conduct, (as measured by their standard;) and the study of these savage religions and moralities may throw some light upon the genesis of the religious and moral feelings in primitive times.

In the attractive affinity existing between parent and offspring, and which is observable among brutes as well as among men, we may recognize the conditions under which the religious sentiment arose. Among the brutes the instinct that leads the parent to watch over and protect its offspring, and which draws the offspring to seek the protection of its parent, is essential to the well-being of the species. This protection on the part of the parent and filial recognition on the part of the offspring continue until the

latter can care for itself. All relations between the two then cease; the parent goes one way and the offspring another, and no trace of the previous connection remains in the memory of either. As we ascend the scale of animal life, these relations become more and more marked and durable until, in man, we see them reach their climax.

The veneration in which the parent was held during life would endure after death had sundered the relations between them, and lead the ignorant and superstitious mind of the Primitive Man to attribute after benefits or injuries, brought about through natural agents, to the approval or anger of the departed. Natural phenomena thus becoming indelibly associated with the memory of the dead, there would gradually arise a personification of these natural powers, and a religion, in which the memory of ancestors would be blended with the phenomena of nature, would be the result. The religions of the lowest existing savages, in which we behold this union of Ghost or Ancestral worship and Nature worship, would naturally lead us to infer that such was the genesis of religious observances in primitive man prior to Revelation.

The religions which greet us at the dawn of history among the Egyptians, Chaldees, and Hindoos, and in China and Japan, down to the present time, furnish us with corroborative testimony. In China and Japan ancestral worship still enters largely into their religious feelings and observances. The "Feast of the Lantern," which consists in decorating the graves with innumerable lights, and placing food near at hand for the spirits of the departed, is still celebrated among them.

The author of this work spent two years traveling in these countries, and enjoyed an opportunity of witnessing this curious and interesting spectacle. Among the ancient Egyptians a similar festival was celebrated under the name of the "Feasts of the Lights." It is more than probable that the custom in both countries had its origin from a common source.

Fetich and Idol worship, so common among savages, are merely phases of ancestral worship. Anything belonging to some one highly venerated, a fragment of bone, a lock of hair, &c., would be prized as being a part of the deceased, and might in time come to be objects of worship as possessing the spirit of the departed—thus Fetich worship would arise. An attempt to reproduce an

image of the departed by rude carving in stone and wood would lead directly to Idol worship. Among existing savages and ancient nations, we find more or less of a blending of all these various forms of religion, but filial veneration furnished the foundation for them all.

The conspicuous objects and phenomena of nature coming in time to be special objects of worship would be classed as good and evil spirits, according to their effect upon the well-being of the individual. Those agents which brought in their train beneficial influences would excite gratitude, and be denominated good spirits; those which caused terror, pain, and death would be called evil, and here propitiation would take the place of true worship.

Whilst the moral sentiment, which has been defined as the desire to shape life according to some conceived principle of *right*, exists among the lowest savages, still a *definite*, formulated code of conduct can have no place where there are a multitude of Beings of diverse characters to please, for the observances pleasing to one would not be pleasing to another; hence, among all nations where Polytheism exists we find no consistent or fixed Rules of Life. Conduct is shifting and conflicting, and *every* act that might be committed may be regarded by the *religious* savage as acceptable to some one of his many gods. Among the Egyptians, Greeks, and Romans the conduct of the worshipper was guided by the character of the particular deity whom he wished to serve. Murder, rape, theft, lying, &c., could all be covered by one or more of their innumerable gods. Jupiter, the chief of the Olympians, was a notorious libertine, and resorted to the lowest subterfuges to carry his base ends; Mercury was a professional thief, and Venus was anything but a lady; and so we might run through the whole catalogue of gods and goddesses with much the same result. And these were the Deities of the common people.

The little *true* morality that did exist among the masses of the Greeks and Romans was the result of state enactments based upon *light* which their wise men had received from the Orient, the cradle of the True religion. At the dawn of history we already behold the light of revelation flooding the world, and the Mosaic law embodied in the Ten Commandments is steadily asserting its sacred influence and fulfilling its Divine mission. From it, as from a font, have flowed the streams of morality which found their

way to China prior to the days of Confucius; to India, and brought forth what there was of good in the Institutes of Menu, and later, caused Siddartha to renounce the pomp and vanities of life to seek in the solitude of the wilderness that enlightenment which enabled him to exercise such a powerful influence throughout India; to Persia, where it found vent in the Sacred Zendavesta; to Egypt, to Phœnicia, and to Greece, where it nourished the wisdom of her greatest sages and enabled Plato to reach those lofty heights which succeeding generations, unsupported by Divine inspiration, have vainly aspired to.

Belief in the existence of One, Supreme, Spiritual (non-material) Being, the Author and Sustainer of all nature, is one so abstract, so refined, and so exalted that it requires a high degree of mental development to entertain it, much less to originate it. Even in these latter days, with all the light of revelation streaming upon us from the past, and among those who are the recognized leaders of scientific thought, this belief is rejected. When we behold such men either positively denying the existence of a Beneficent Creator, or, under the title of Agnostics, holding aloof from the acceptance of it, we should not be surprised that the unaided powers of early man failed to reach such sublime heights. From the contemplation of what we see in our own times, we should be prepared to *anticipate* the *necessity* for some *direct* and *unmistakable* revelation.

The strongest *extrinsic* argument for the truth of Revelation lies just here: that if there be a Being who is not the Universe, but the Author of it, He would not permit the rational creatures whom He has called into being to grope helplessly along in search of Him without some revelation of Himself. The warrant for this belief is deeply seated in the consciousness of us all, and, unless we willfully close our eyes to the great truth, no one, however low his intelligence, can fail to recognize it.

The religions of the primitive man are the blind gropings of the Child after its Parent, and who that believes in the existence of that Parent can fail to believe that He would make known His presence. To the earnest seeker after truth the issue of this great question might be allowed to hang upon this single argument; its strength appeals to such a mind with absolutely irresistible force. This irrepressible longing after the cause of its being, which is in-

nate in every human soul, however degraded, and which always develops into worship if not willfully smothered, has been planted there and is the highest truth known to man.

There is *Something* that governs the constitution of the mineral which compels its atoms to arrange themselves around certain axes of crystallization, and almost every mineral has some crystalline form which serves to distinguish it from all others; there is *Something* that governs the constitution of the plant, which causes the atoms of the inorganic matter of the crystal to assume other relations, one to the other, and the phenomena of Vegetable Life result: there is *Something* that governs the constitution of the animal that causes these atoms to assume quite other relations, and the phenomena of Animal life are exhibited; there are still other *Somethings* which stamp each form of vegetable and animal life with features peculiar to itself. Thus, there are animals which microscopically and chemically cannot be distinguished from a bit of albumen, and from this lowest form to the highest there is an infinite series of gradations. *New Somethings* have been constantly at work, bringing the atoms to *higher* and *higher* relations, enabling these *new Somethings* to manifest their existence to man's reasoning faculty. Every advance step made was in *obedience* to some *new Something* impressed upon the atoms.

The various forms of Life made their appearance one after another, each manifesting *something different* from its predecessor, until we reach the highest. The SOMETHING peculiar to man led him to seek after the author of his being; it aroused within him the consciousness of *right* and *wrong*, and taught him to look upon himself as a free agent, that he was at liberty to act or not to act, to accept or to reject. This Something has received the name of Soul, and in it we recognize the essential nature of man; *that* which converted the mass of bones, nerves, and blood-vessels of the animal into what we call a man.

The Moral Principle in man, by means of which he arrives at a knowledge of what he *Ought* to do, (that is, whether he acts according to the spirit of the standard he accepts,) in direct opposition to the calls of self-interest, which might point in an opposite direction, constitutes, as far as we are able to determine, his grand distinguishing feature. We have no reason to think that any such Principle exists in the brute creation, and hence, to them we as

cribe no moral responsibility. They cannot be guilty of *wrong*-doing, and with them the laws of *material expediency* reign Supreme. But with the imposition of the moral principle upon the animal nature, a new Being came into existence, and Man, with all his longings and aspirations, and power to discriminate between the Right and the Wrong (according to his standard) stepped upon the theater of creation.

The brute elements gradually gave way as the new principle advanced, and this inward progress, assisted by the improved external environment, was soon reflected in the amelioration and elevation of his material condition. The powers of self-improvement with which he had been endowed enabled him to widen, with increasing rapidity, the gulf which separated him from the brute; and in proportion as his mental state developed, did he lay under tribute those forces of external nature before which he originally stood in awe.

The religious feeling awakened in him by the promptings of his higher nature and by the contemplation of external forces which he could not understand, and which he at first regarded with terror, gradually became more and more elevated with advancing knowledge. When, in the fullness of time, he had reached that period in his growth which fitted him for the reception of the highest Truths, those truths were revealed to him; and the conduct of his life, which had before been conflicting and uncertain, was now directed by a fixed and consistent code, which, in its completeness, subtends the highest state of development of which we can conceive his nature capable; while, at the same time, his higher spiritual needs were supplied by being turned to the contemplation of a Non-material, Eternal Essence, as the Author of his Being.

If it be granted that there is a Being or Power which is not the Universe, but the Author of it, and if it be further granted that there exists in a single human soul an impulse which leads it to search out this Being, then it must also be granted that this Impulse was placed in Man by this Uncaused Being. But if this impulse owes its origin to the Uncaused Being, is it rational to assume that He (the pronoun *He* is a more honorable title than *It*) would permit this feeling to die away into naught and remain unfulfilled? On the contrary, is it not in the highest degree rational that the Uncaused Being would so manifest Himself to Man as to render His

existence unmistakable? *But how could such a revelation be made to Man except through such avenues as would render it impossible for him to confound the revelation with the Phenomena of Nature?*

Let us steady ourselves before this great question and look it squarely in the face. What method would the Supreme One be likely to choose to make known his existence to Man? Would it be through the medium of material phenomena? Obviously not, for such a revelation would most certainly be confounded with the ordinary phenomena of the material world, and it would be of no avail in awakening man's understanding to a comprehension of its true nature. Howsoever fierce the elements might rage, the earthquake, the lightning flash, and the thunder roll, there could be no echoing response in the mind of man except that of blind terror. There would be nothing in these material forces to appeal to his understanding as the revelation of the existence of his Maker. A Superior Being, then, if it wished to impress an Inferior with the knowledge of its Superiority, would select some method which would appeal to the understanding of that Inferior, through the medium of its *highest faculties.* It is rational to suppose, therefore, that the Supreme Being would select *human language* and human Intelligence in communicating with Man, and not the *language* of *lower nature* which is manifested to us in the phenomena of external world. Amid the thunders and lightning of Sinai Moses might have been overcome with awe and terror, but had not a VOICE, in human language, spoken to his understanding, the world would have remained shrouded in darkness, and man would still be groping helplessly along without one ray to illuminate his path. Without that voice the thunder and lightning of Sinai would have signified nothing more to Moses than the raging of the elements. Furthermore, had the language been other than his own how would he have been able to discriminate between its (to him) unintelligent mutterings and the undertones of the pealing thunder? He who recognizes the existence of a Being distinct from the Universe and the Author of it, and still maintains that no revelation has been made to man other than that which is manifested in the Material Creation external to Man, forfeits his claim to be considered a sound reasoner.

The human mind estimates the *dignity* of things by the character of the impressions received and the *direction* whence they come.

If these impressions are received *via* the phenomena of what we call the lower creation, then the object whence the impressions proceed is looked upon as belonging to the lower world; but if the impressions come *via* man's higher faculties, the object is regarded as Intelligent, and is esteemed accordingly.

If, therefore, it be granted that human Intelligence and Language are the Highest Phenomena which the world presents, and if it be further granted that it is rational to assume that the Uncaused Source of things would make a revelation of His Existence. then it must be granted, by all the laws of reason, that Man would be appealed to through the medium of Intelligence and Human Language.

The earliest written records of the race demonstrate that Man, even at that early period, had attained to a knowledge of the ONE Supreme Being, and these records claim that this knowledge was a direct revelation through the medium of human language. The wisdom of the Jews, Chaldees, Hindoos, Egyptians, and Chinese evidently had its origin from a *Single* Source. The great similarity which is traceable in much of their moral teaching and traditions would, of itself, indicate this. This unity of origin of the moral codes of early nations and the *great truth*, that whilst mankind has developed in every other direction, but has not evolved a Higher Code than the one which has been handed down from the dim shadows of the past, tend to strengthen the belief that, originally, this moral code was not the result of a gradual development, but of the nature of a direct revelation.

That great progress has been made in the *practice* of morality by the masses, is beyond dispute, but to the moral code itself nothing has been added during over three thousand years of development.

Sir James Mackentosh was so struck with the stationary character of moral principles that he affirmed that no further advance can be made in morals. He says: "Morality admits no discoveries. * * * * * More than three thousand years have elapsed since the composition of the Pentateuch; and let any man, if he is able, tell me in what important respect the rule of life has varied since that period. Let the Institutes of Menu be explored with the same view; we shall arrive at the same conclusion. Let the books of false religion be opened; it will be found that their moral system is in all its grand features the same."

Why is it that man, who has made such tremendous strides in all things else, has yet been unable to add one jot or tittle to those commandments which Moses declared unto the children of Israel? Even He who suffered on Calvary claimed only to have fulfilled the Law, and not to have added to its amplitude. In His life He illustrated the possibilities of humanity, and in His teachings He showed the scope of the moral law.

"Think not that I am come to destroy the law or the prophets; I am not come to destroy, but to fulfill.

"For verily, I say unto you, till heaven and earth pass, one jot or one tittle shall in no wise pass from the law till all be fulfilled."

The fundamental character and eternal fitness of the Ten commands to fill man's highest needs are illustrated with greater and greater force as civilization advances. Society is progressing along the road to which they serve as beacons, and with every advancing step the validity of their claim to be considered the only sure guides of human conduct becomes more and more apparent. Looking back upon the past, we can appreciate the tremendous strides which man has made, and, projecting ourselves into the future, we may form a vague conception of that state of Society when the law shall be fulfilled in the life of each individual member thereof. A people guided wholly by these teachings would form a community besides which the most sanguine speculations of modern thinkers pale into insignificance. What child of ten summers cannot repeat from memory these ten commandments? But where is the mind that can measure their length and breadth, and sound their height and depth? He alone who had no where to lay His head, and suffered the agonies of an ignominious death, has given us its full measure and taught us its deeper meanings.

1. "*I am the Lord thy God.* * * * * * *Thou shalt have no other gods* BEFORE ME."

In this preamble we have a distinct declaration of the ONENESS and Supreme character of the Law Giver, and are warned that the fealty which is due Him, and Him alone, is not to be given to any other Being whatsoever—that we are to look up to Him as the HIGHEST, and the Author and Sustainer of the Universe.

2. "*Thou shalt not make unto thee any graven image, or any likeness (Symbol) of anything that is in heaven above, or that is in the*

Earth beneath, or that is in the water under the Earth. Thou shalt not bow down thyself to them, nor serve them."

This second command calls upon us to contemplate the Divine Being as non-material in His nature, and carries with it, by implication, that all attempts to represent Him to the understanding through the medium of what we call material things is both a reflection upon the Eternal One, and debasing to ourselves.

The confounding of the Symbol with the *true nature* of the thing symbolized is too often the result of the use of such symbol; not only among the ignorant and superstitious, but even among those who lay claim to the highest attainments. The polytheism into which the Israelites subsequently fell, and the numerous gods of the Egyptians, Greeks, and Romans, furnish illustrations of what followed the violation of this law. In our own times we have a still more striking illustration of the same fact. From looking upon the Universe, with its blending of Matter and Force,* as a symbol of that which lies beneath—as the expression to our consciousness of an Eternally existing Ideal—the speculative mind of to-day has become so absorbed in the study of this symbol that, losing sight of the true relations of things, it has confounded this outward expression with the Divine Being Himself; and Pantheism or Atheism (for in essential nature they are the same) is the natural result. The old Egyptian bowed down before *Matter in detail*, (for his gods were innumerable,) and with reverence; the modern Pantheist has consolidated all the gods of Egypt into one, and bows down to matter and its attributes as a whole—but not with reverence!

Judged by the canons of sound philosophy, the Pantheist stands convicted of folly and inconsistency as compared with the old Egyptian whom he affects to despise! Vanity of Vanities!!

3. "*Thou shalt not take the name of the Lord thy God in vain; for the Lord will not hold him guiltless that taketh his name in vain.*"

Nothing tends so much to diminish the reverential awe in which a thing is held as to invoke it lightly on inconsequent occasions. This command, therefore, enjoins upon us to regard with deepest veneration that *name* which usage has made the cognomen of the Divine Being and which worship has consecrated, and only to permit it to pass our lips with the most exalted feelings of rever-

* Or by whatsoever titles we choose to designate what we see around us.

ence. Among the ancient Hebrews, the word Jehovah was regarded with such sanctity that it was only used on occasions of the highest ceremony.

Much of the *practical* Atheism among men is directly traceable to their flippant use of a word which early instruction has taught them to regard as sacred. Disregard of the word is soon followed by disregard of what it represents, and Atheism is the result. The mind that does not devote some portion of its time to the contemplation of higher things is truly atheistical in its attitude.

The importance of the strict observance of this law cannot, therefore, be exaggerated.

4. "*Remember the Sabbath day to keep it holy. Six days shalt thou labor and do all thy work.*"

The profound practical wisdom underlying this command is verified by every-day experience. That at least one day in seven should be devoted to relaxation, both of body and mind, does not require the learning of the physiologist to convince us, for every one subjected to six days' continuous toil is willing to testify that the seventh comes as a welcome haven of rest. The conservation of the vital energies is of the utmost importance to the well-being of the individual, and, therefore, of the nation, of which he is a component part. And it is even of still wider significance; for the physical weakness incurred by unremitting toil is entailed upon posterity, and if ensuing generations should pursue the same policy it would only be a question of time when physical degeneracy would cause the extermination of the race.

The importance of the injunction to set apart that one day for the special contemplation of higher things, or, in other words, to keep it holy, can be fully appreciated by comparing the moral development of a community where this law is regarded and one where it receives no observance. The cessation of all labor is a physical necessity, and the proper observance of the day is no less a moral necessity. Violation of either law must inevitably be followed by retrogression.

5. "*Honor thy father and thy mother.*"

The family is the unit of society, and upon the teachings there inculcated and fostered hang the welfare of the State. The observance of this command stimulates the growth of all those virtues which make society possible; it furnishes the foundation upon

which the superstructure must rest. Among the brutes a certain kind of affection may be said to subsist between the parent and the young, but the tie is broken as soon as the offspring is sufficiently mature to take care of itself. Among many low savage tribes the filial and parental feelings are but poorly developed, and the aged and infirm are often allowed to die in neglect and destitution.

This command, therefore, is the very corner-stone of the social edifice, and its strict observance, by developing all the kindly sympathies of human nature, will almost insure a regard for the five commands which follow.

6. "*Thou shalt not kill.*"

That petty warfare which is almost universal in the savage state, where every man's hand at the slightest provocation is turned against his fellow, has happily diminished with advancing civilization, and among the representative peoples of the earth it is no longer considered an enviable distinction for a man to be able to boast of the number of fellow-creatures whom he has slain. Indeed, among us individual violation of this law is of rare occurrence as compared with the savage state and retributive justice soon overtakes the murderer. But this command not only applies to the individual; it applies with equal force to a plurality of individuals banded together as a community or as a nation. Murder committed by an individual and murder committed by a nation only differs in the magnitude or extent of the crime and the difficulty of identifying the criminal or criminals.

The responsibility of the wholesale murder of which nations are still guilty is referable to the rulers of the nations concerned. The human automata who hack and hew one another in pieces on the field of battle and call it glory, may be, and generally are, absolutely ignorant of the causes of the quarrel which arrayed them against their fellows in deadly combat. They but obey the commands of superiors, and upon their rulers the crime must rest. These same rulers would shrink with horror at the bare suggestion of imbruing their hands in the blood of another, yet they hesitate not, for some petty offense, to embroil their country in a war which may involve the death of thousands. They foster the warlike spirit among men by holding out great rewards for achievements whose importance is rated by the number of dead bodies

which strew the plain. The poet, too, has lent his "sacred fire," exhausting the rythm of language and the stores of fancy to throw a false halo over deeds that are only to be compared with the wild ragings of ferocious wild beasts. War is only justifiable in self-defense and to redress grievous wrongs, and over its ensanguined deeds the veil of oblivion should be drawn, not the triumphal arch reared nor the pen of the poet invoked to sing the glories of victorious violence. But the advance of civilization has wrought wonders in destroying the war-like spirit among men. In the Valhalla of the old Scandinavian we behold the ferocity of that early period projected into a future state, and the happy warrior who died in battle was received into this sanguinary paradise, where, for all future time, his happiness was to consist in everlasting carnage and drinking great bouts from the skulls of enemies slain in battle by way of refreshment. To the softening influence of Christianity, the revival of learning, the invention of printing and gunpowder, and the application of steam for purposes of locomotion are to be attributed the rapid decline of that war-like spirit which, during the middle ages, converted the whole of Europe into one vast battle-ground for contending armies. In our own times war is, *comparatively* speaking, of uncommon occurrence. The great nations of the earth no longer enter into conflicts with the *avowed* purpose of conquest, and if this be the ulterior motive still an outward regard for decency and justice constrains them to fabricate some pretext under which to cloak their true design. To the superficial observer ignorant of history the armed hosts of Europe would seem to refute the assertion that the war-like spirit is on the decline. But such is, nevertheless, the case. The general diffusion of knowledge is constantly increasing the number of the intellectual class and widening the bounds of their influence, and the growth of commerce, manufacture, and other industrial pursuits are rapidly multiplying the number of those interested in preserving peace.

As man's higher powers develop, he becomes more and more averse to an occupation where the brute elements of his nature are brought into play to the almost entire exclusion of the exercise of those nobler faculties upon which all moral and material advancement depend. Europe of to-day presents to us a transition stage, and her armed hosts are but the expression of autocratic

power bent on maintaining the prestige of Imperial rule. It is not the individual lust for war and conquest which swells the huge armies of modern Europe, but the edict of Despotism, which, seeing in the signs of the times the brief tenure of its power, attempts to avert the approaching inevitable by stirring up external strife, thus hoping to turn the thoughts of the people from the contemplation of their own debased condition.

Were ninety-nine out of every hundred of the men who are now under arms in Europe given the choice they would disband to-morrow, and, returning to their homes, engage in the useful pursuits of peace. But to them no choice is given. Forced to shoulder the bayonet at the point of the bayonet they must either obey as slaves or, rising in rebellion, throw off the yoke of personal rule and assume the government themselves. Every effort is being made by European rulers to foster the decaying military spirit, but as well might they essay to controvert the laws of nature as to attempt to stem the tide of human progress and turn it back into its original barbaric channels. The measure of their crimes is nearly full. "The mills of the gods grind slowly, but they grind exceeding small," and retributive justice sleeps not! The moral law must be fulfilled among the nations as well as with individuals, and even now, though thick war-clouds envelope the horizon, the discerning eye, by the aid of the light which sheds its rays into the future from the past, may catch a glimpse of a new and brighter era.

The universal peace which reigned on the earth at the Nativity, and of which the great poet sings, may be looked upon as an earnest of the future fulfillment of this moral law.

"No war, or battle's sound,
Was heard the world around;
The idle spear and shield were high up hung;
The hookèd chariot stood
Unstain'd with hostile blood:
The trumpet spake not to the armèd throng;
And kings sat still with awful eye,
As if they surely knew their sov'reign Lord was by.

But peaceful was the night,
Wherein the Prince of Light
His reign of peace upon the earth began:
The winds, with wonder whist,

Smoothly the waters kiss'd,
Whispering new joys to the mild ocean,
Who now hath quite forgot to rave,
While birds of calm sit brooding on the charmèd wave.

Yea, truth and justice then
Will down return to men,
Orb'd in a rainbow; and, like glories wearing,
Mercy will sit between,
Throned in celestial sheen,
With radiant feet the tissued clouds down steering;
And heaven, as at some festival,
Will open wide the gates of her high palace hall."

7. "*Thou shalt not commit Adultery.*"

This law must be interpreted as not only forbidding that promiscuous intercourse which exists among brutes, but also as carrying with it the injunction to have but one wife and one husband; for only under these restricted bounds do the domestic virtues attain to their highest development. Through the working of this law, woman has been gradually elevated from the position of a degraded slave to become man's companion and friend, lending her aid and encouragement in the struggles of life. Whether Moses fully appreciated the great truth that man could only attain to his highest elevation by restricting himself to one wife, is uncertain; but, whether he did or did not, its existence at that early period is altogether inexplicable, except on the ground of inspiration. Among Christian nations, monogamy is recognized as the only true condition under which men should live, and to its prevalence among them must be attributed one of the causes of the high civilization to which they have attained. Among Eastern nations, polygamy is not only sanctioned but it is the rule with those who can afford it; the result has been that they have either stood still, or even retrograded, in the scale of civilization. The almost universal disregard of this law among them has furnished no opportunity for the development of those lofty sentiments of affection between husband and wife which form such a striking feature of our own civilization. Those feelings, which in the brute and the savage serve to insure the propagation of the race, have been refined and spiritualized to a degree which the barbarous nations of the Earth cannot understand.

The influence of this lofty feeling of love upon the destinies of

men cannot be exaggerated. Its potent power to elevate and ennoble the base may be traced in individual members of every community. The dissolute and the profligate, under its powerful influence, are lifted from the slough into an atmosphere of such purity that their whole inner nature becomes renewed, and the entire man is lifted to a higher plane. What is true of the individual is true of society. Polygamy renders the existence of these feelings an impossibility, and in their stead are cherished those baser passions which we possess in common with the brute; hence, a high state of society and Polygamy are absolutely incompatible. The existence of this law, at a time when Polygamy was universally practiced, for even the Great King Solomon was possessed of three hundred wives and seven hundred concubines, demonstrates that its originator had in view the highest possible spiritual elevation of the race.

8. "*Thou shalt not Steal.*"

This command not only embraces the surreptitious taking which is called stealing or theft, but it includes all manner of taking from another without his consent. This command has for its basis the eternal laws of Equity and Justice. The necessity and utility of this law, with reference to the individual, is recognized among all civilized people and many savages, but its binding power upon large bodies of men, as a nation, is not so universally conceded. But the nation that takes from another nation without just cause and without its consent violates this law as much as the midnight pilferer who steals his neighbor's goods, the only difference being in the extent of the damage done. Theft, on the part of nations, is now carried on with a certain regard to decency, and among civilized nations some pretext, however superficial, is the guise under which it is committed. This regard for the abstract principles of equity and justice which now prevails among the most advanced nations enables us to appreciate the great progress which mankind has made in the observance of this law in the past few hundred years. The shameful partition of Poland and the gradual absorption of India by England are the most glaring thefts, on a large scale, since the time of that highway robber, Napoleon the First.

In spite of the innumerable violations committed both by single individuals and individuals banded together as a nation, the stricter observance of this law is making daily progress.

9. "*Thou shalt not bear false witness against thy neighbour.*"

Which, being further interpreted, means thou shalt not practice falsehood and deceit.

This command naturally follows the preceding, for to make false statements concerning another is to steal away his character and render all men distrustful of him. Furthermore, deceit and falsehood, if universal, would render society, and therefore civilization, an impossibility, for the very existence of a society depends upon the mutual faith and trust reposed in the individual members thereof.

10. "*Thou shalt not covet* [or envy] *anything which is thy neighbour's.*"

Of all the moral laws this is the least observed, and most difficult to observe, for it pre-supposes the highest possible development of the moral character. No living man can flatter himself that he has attained to this high elevation. A man of unblemished rectitude of action, who would scorn to commit a base deed, will still look with envy upon the possessions of another. This high command, which carries with it the injunction "to love thy neighbour as thyself," forms a fitting climax to a moral code which, if followed, must inevitably lead to the highest conceivable plane of development. It is the cap-stone of the finished pyramid, to which it is impossible to add, and from which nothing can be taken. The commandment which forms its base and that which completes it were united by the Great Teacher into one Grand Commandment to express the spirit of the whole: "Love the Lord thy God with all thy heart and with all thy soul, and thy neighbour as thyself."

The great monument of Cheops rises not more conspicuously above the sands of the Egyptian desert than this great moral pyramid above the wastes of human life.

Such is the code of Ethics which greets us at the very dawn of history. Five hundred years before the Vedas of the Hindoos were written, nine hundred years before the days of Confucius, Buddha, and Zoroaster, and eleven hundred years before Socrates and Plato, we find Moses delivering to his people a moral code which still marks the limits of our aspirations, and to which nearly thirty-five hundred years of development have not been able to add one jot or tittle!

Whence came these laws which have served as a fountain for all the law-givers who have entered the world? Can it be possible that the human race, at a time when the great mass of the people were still steeped in the extreme of barbarism, could have evolved a moral code which defies the highest civilization of the nineteenth century to improve upon? Did the truths of morality belong to that class of facts which depends solely upon the penetrating power of the mind to arrive at, we can understand how a great genius might be able to make great discoveries therein. The methods of reaching geometrical truth are the same now as in the days of Pythagoras or Euclid. But the truths of Morality belong to the teachings of *experience, and cannot be attained to by any process of pure thought. Utility* is the test to which all advance in morality and government must be subjected.

The fable relates that Minerva sprang from the head of Jupiter fully armed, so this law comes down to us from the womb of time perfect and complete. Verily, the Sociologist who framed this code for the conduct of human life exhausted the science, and has left nothing for comers-after to do but to follow meekly in his footsteps.

Section VI.

Résumé of the Four Stages of Social Development.

The chief features which characterized the various stages through which the race passed in its upward course of Development may thus be briefly summarized:

I. Vegetarian Stage.

During this period the diet of early man was exclusively vegetable, consisting of the various fruits and tender roots which are the spontaneous products of a warm country. He was naked, for the climate would not suggest the need of clothing; he was shelterless, except the slight protection which the plaited boughs of trees afforded; he was fireless, for as yet fire was not required, either to supply warmth or prepare food. The conjugal relations were uncertain and temporary, and probably endured for but a short time, a new division taking place among the males at certain intervals. The offspring would fall to the care of the female parent, as among brutes,

until the children could shift for themselves. Language was rudimentary, and religious sentiment was just beginning to assert itself. As yet he had no arts of even the humblest description; and his weapons consisted of rude stones and clubs with no attempt at artificial improvement.

II. HUNTING Stage.

This was ushered in when the supply of vegetable food was no longer able to meet the demands of an increasing population. The pangs of hunger would lead him to imitate the carnivorous brutes, and man became a flesh-eater.

This method of acquiring food would lead to the improvement of his weapons; and stone implements and better fashioned clubs, together with the lance and bow and arrow, would be invented. In the pursuit of roving game nomadic habits would be necessitated to a much greater degree than formerly, and he would thus be led beyond the warm country of his birth into colder regions, where his naked body would be exposed to the blasts of a less friendly clime. He would thus learn to throw around him the skins of the beasts he had slain for food. For shelter he would seek the protection of natural caverns until his lowly mind taught him to build rude huts of stone or timber over which skins might be thrown. Some great conflagration, caused by lightning, (Promethean fire,) or the vicinity of an active volcano, would draw his attention to the qualities of fire, and he would soon learn to appreciate its benefits when overcome by cold. From the use of fire for the purpose of warmth to its use in preparing animal food is but a short step. The great blessings to be derived from fire would incite him to discover some method of artificially producing it.

The conjugal and parental relations became more enduring, and families began to form, which, in time, aggregated into tribes with elective chiefs. Language and religion became more highly developed, and ancestral or ghost worship, with personification of natural objects and forces, became established.

Periods when there was a dearth of game would teach him the expediency of domesticating the tamer animals for purposes of food. When this habit was well established the third or Shepherd Stage was inaugurated.

III. SHEPHERD Stage.

Man now no longer depended upon the uncertainties of a hunter's life, and the possession of numerous herds of sheep and cattle furnished him with milk and flesh in abundance. His only care was to find proper pasturage for his herds, and this naturally led him to the fertile plains and well-watered valleys.

The rude arts which necessity taught him in the Hunting Stage of his career were brought to a higher state of development. The leisure afforded also gave opportunity for the reflective faculties to grow, and the savage ferocity, which his hunter's life did so much to encourage, became mitigated by more refined and comfortable surroundings, and governmental and religious institutions became better established. The prolonged stay in one spot would encourage experiments in planting, and this would gradually initiate the Agricultural Stage of development.

IV. AGRICULTURAL Stage.

The spontaneous fecundity of his great mother had supplied the infant man with all his wants, but, as he became stronger and more able to care for himself, she cast him off, and the discipline to which he was subjected in his battle for life, by calling into exercise all his latent powers, set on foot that career of *artificial* development which shall not cease until he has fulfilled the end for which he was created. Having been trained in the school of hardship and necessity, he once more returns to his parent to seek the aid which she had before wisely withheld; but her gifts are no longer free, and she demands payment in patient toil and industry.

The progress of man in this the latest stage of his life has been, comparatively speaking, rapid, and the further he advances the more rapid does his progress become. One after another the arts and sciences developed, and, reacting upon another, carried the whole to higher elevations; and the same is true of government and all things else. The process of nation-making was indeed a fiery furnace, but it welded together the fragments of humanity, and prepared the world for higher civilization.

CHAPTER X.

DESIGN IN THE UNIVERSE—PERSONALITY OF THE UNCAUSED BEING—FURTHER CRITICISMS.

This also we humbly beg, that human things may not prejudice such as are Divine, neither that from the unlocking of the gates of Sense, and the kindling of a greater natural light, anything of incredulity or intellectual night may arise in our minds toward Divine mysteries.—*Bacon.*

The existence in the external world of "Design," or "Purpose," or "Preëstablished Harmony," or by whatsoever name we choose to designate the power of predetermining results by the adaptation of means to the accomplishment of ends, has always been a favorite point of attack for that school which affects to interpret all things in terms of Matter, Motion, and Force.

We will now endeavor to show that, from their own stand-point, the advocates of this school are guilty of inconsistency; that their arguments rest upon the most fallacious grounds, or, rather, that they are absolutely without any foundation whatsoever.

They assert that man is nothing more than a product of those atoms and forces which we see playing around us in nature; and that in the building up of a crystal, in the formation of a plant or an animal, in the production of the human mind, we behold only the varying results of the operation of the same forces and atoms.

Accepting their position, for the time being, we will now proceed to prove how absolutely inconsistent they are in denying the existence of a Designing Power external to man. If Man be a *natural product*, he belongs to nature as much as the crystal which helps to form the rock, or the moss that covers it; and the attributes which he exhibits, mental or otherwise, are as much *natural phenomena* as the attributes of the crystal or the attributes of the plant. Self-consciousness, language, reason, the results of his handiwork, (art,) and all things else, are nothing more than the products of natural forces.

In the aggregation of atoms called Man, natural forces have,

according to them, become *conscious of themselves—i. e.*, have attained to a knowledge of their own existence. Now, the aggregate of natural forces, called Reason, has invented a certain word, "Design," to designate certain methods of its action. This word is meant to convey the notion of a *pre-conceived* end to be accomplished, and in the adaptation of the means to attain this end, we are to recognize the Designing forces in operation. The *self-conscious* forces acting in man, not being able to *distinguish* the same element of pre-ordination or Design in the actions of other natural forces, a new word was invented, called *chance*, which is intended to convey the notion that the End attained was not foreseen or pre-determined by them. Thus, whilst the natural forces constituting human reason apply the title of Design to their own actions in the construction of a house, they withhold that title from the results of the natural forces which are engaged in the building up of the body, a mass of rock, or a crystal. But by what warrant have one set of natural forces to arrogate to themselves the exclusive power of pre-determining or foreseeing results, and to deny the same power to other natural forces?

What right has one set of the forces of nature, because it is conscious of its doings, to assert that other aggregates of the same natural forces are unconscious and designless in theirs?

Obviously, this assumed superiority is without foundation in *absolute* knowledge, and the natural forces constituting a crystal, or a plant, might retaliate with an equal show of reason. A closer investigation of nature discloses the fact that even the most trivial phenomena occur, not "*hap-hazard*," as the word Chance was intended to indicate, but that *the same adaptation of means to Ends* exist outside of human volition as in human volition. The word "Chance," has, therefore, been discarded from the vocabulary of philosophy, and the word LAW has taken its place.

Wherever there is a special adaptation of means for the accomplishment of an End in human affairs, we call it Design; wherever we behold *the same* occurring external to human volition, we call it Law, thereby implying that there is some vital distinction between the two. But the distinction exists (to those who deny, or who refuse to accept, the existence of a Creator) *only* in the name; and those who look upon natural forces as the origin of all things, must regard Design in Man as precisely the same as *Law* acting

external to Man. Both are the expressions of natural forces, and both act in exactly the same way by adapting means to Ends. But, say they, one is conscious of itself, the other not. How do they *know* that the plant is not conscious of its own existence? They cannot prove it, and to be consistent, they ought to acknowledge that such is the case, for, being similar in two very important features, in their genesis and mode of action, the probability of their resemblance in the third is that much greater.

Should it be held that the power of adapting means to ends, which we see exhibited by a plant in taking up and assimilating its food, or seizing on to something for support, does not *reside* in the plant itself, but in *Something* outside of it, (which would be helping to overthrow their own position,) then, I reply, that *that something* constitutes a part of the essential nature of the plant, and bears the same relation to it that the Conscious I does to the nerves, muscles, and bones of my body. In other words, the aggregation of atoms constituting the plant, with the laws governing it, must be regarded as a unified whole in the same measure as the atoms composing my body and the laws governing them constitute the unity called I.

These thinkers of all men should be the last to ascribe to themselves *that* which they deny to the rest of nature, for by so doing they at once confess that there is *something in themselves* which is *not to be found in the rest of nature.* And then the question comes with startling force, *Whence came it?*

In spite of all their fundamental tenets, *they constantly* reason and act as if they were *outside of nature* instead of being *a part and parcel* of her, possessing what she has, but *nothing which she has not.*

Mr. Spencer and his theories are, according to his own showing, as much natural phenomena as thunder and lightning, and, if he attribute Design to his productions, so also must he to the thunderbolt which rives the oak. If he deny designing power to external nature, then must he deny it to himself also! From this conclusion there is no escape.

Disbelief, then, in the existence of a Supreme Being distinct from the Universe will compel us to recognize *conscious existence* and *designing power* in every atom and aggregation of atoms

throughout nature,* in the crystal as well as in the plant, in the animal as well as in the highest human being—all are on an equal footing. It compels us to look back upon an unutterable past and to look forward into an unutterable future, in which an innumerable multitude of self-conscious beings have been and will be acting and reacting upon one another, each one *imagining* that *it alone* possesses self-consciousness.

By the recognition of One Supreme, Uncaused Being, who stands in relation to the Universe as Creator, all these difficulties disappear. We may now look upon ourselves as peculiarly set apart and elevated above the surrounding world, and endowed with Designing powers for a special end. In other words, we can now, with some show of reason, believe that what we call Design in ourselves is very different from what we call Law in external nature. We may now look upon these Laws as the *unconscious agents* of a Creating or Causative Power, and we need no longer regard them as *consciously adapting means to ends*, which power thus becomes the distinguishing feature of humanity. With this self-conscious adaptation of means to ends has been conferred FREEDOM, and thus we attain to another distinction between Design and Law: a Designing Power MAY, Law MUST, act.

Our moral nature now has room to expand, and feelings of genuine worship will take the place of the previous dead fatalism which withers up the soul and paralyzes life. But we are not

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* "Has matter innate motion? Then each atom,
Asserting its indisputable right
To dance, would form an universe of dust.
Has matter none? Then, whence these glorious forms
And boundless flights, from shapeless, and reposed?
Has matter more than motion? Has it thought,
Judgment, and genius? Is it deeply learn'd
In mathematics? Has it framed such laws,
Which, but to guess, a NEWTON made immortal?
If so, *how each sage atom laughs at me,*
Who think a clod inferior to a man!
If art, to form; and counsel, to conduct;
And that with greater far, than human skill,
Resides not in each block;—a GODHEAD reigns,—
Grant, then, invisible, eternal, mind;
That granted, all is solved."

— *Young*—"*Night Thoughts.*"

to look with contempt upon the rest of nature, for the grand framework of the Material Universe is also the expression of the Will of the Great First Cause, upon whom our own existence depends; only He has taught us, in the self-consciousness with which we have been endowed, that we are to regard ourselves as far higher in the scale of being than it, and that in our contemplation of Him we are to draw our *Symbols*, not from the mighty suns which fill immensity, each revolving in its appointed path, nor yet from those space-annihilating forces which bind into an harmonious whole the uttermost limits of the Material Universe.

Where, then, shall we seek for symbols? Can it be satisfactorily determined that *our conception* of *what we call Law* in external nature is *inferior* to *our conception* of what we call *Design* in ourselves?

The study of nature demonstrates that its phenomena are suspended one from another, forming an endless chain (as far as we can practically determine) of Cause and Effect, and the Cause of a thing becomes a Law unto that thing. Our idea of Law is, then, that of a Causative Power working through *Necessity*. As natural causes present us with an endless chain, it is obvious that, *Experimentally*, we can never arrive at the notion of an *Uncaused* Cause or a *Spontaneous* Power, for this would pre-suppose that we had *circumscribed* the Universe. It is plain, therefore, that from external nature we can form no idea of a Spontaneous agent or of a Causative power working otherwise than through *Necessity*. But, looking in upon ourselves, the conscious power of volition to act or not to act, to come or to go, engenders within us a notion of Spontaneity which external nature cannot supply. (With the savage and superstitious, Spontaneity is, indeed, ascribed to the powers of nature, but the notion is but a reflex of what they are conscious of in themselves.) Thus, by the recognition of our own conscious freedom of action we arrive at an apprehension of the *possible* existence of an Uncaused Causative Power. Now, as an uncaused thing must be greater than that which is caused, and as our notion of Law is of something that is *Caused* or necessitated by something else, it is obvious that the word Design, which carries with it the idea of *Spontaneity* or freedom to act or not to act, should be applied to the methods of the Uncaused Cause of things in preference to any other word which our vocabulary affords. In

a word, our conception of Design is higher than our conception of Law in the same measure that Freedom is higher than Compulsion.

Mr. Spencer, and those who think with him, in denying to the First Cause of things Designing power and Spontaneity of action are guilty of the most extraordinary inconsistency, for, having postulated an Uncaused First Cause, they still fetter it by the iron bonds of *Necessity;* this Necessity being certain notions of Law which they have derived from the study of the phenomena of nature.

But it is our bounden duty to think of the First Cause in the highest terms in our power, and if we recognize in the *notion* of Spontaneity or Freedom something higher than that conveyed by the word Law or Necessity, then we have no choice left but to regard the First Cause of the Universe as a Spontaneous or Designing Power.

This same school of thought seeks to destroy the Personality of the Uncaused Cause of things, and under the specious guise of humility affirms that we cannot justly speak of Him as a Person without detraction.

The great error underlying this position is exposed when our notion of Personality is clearly analyzed, and we will then come to understand that the only perfect Personality is the Uncaused Being and that all other Personalities are but approximations to this Perfect one.

The Personality or Individuality of a thing is measured by the characteristics or qualities which are peculiar to itself and by its Independence. The more *unique* its attributes and complete its Independence the greater does its Personality become. To render this clear to the mind, we have but to turn to external nature and trace the gradual growth of Personality from the amorphous Inorganic to the highest form of the Organic, Man, in whom Personality reaches its fullest expression among terrestrial things.

A heap of sand possesses little or no individuality as compared with a crystal, with its geometrical figure and planes of cleavage. A lump of charcoal has a less degree of individuality than the gem which sparkles on the arm of beauty. There is but little distinction among the leaves of the same tree or among the blades of the same species of grass. In the lower walks of creation indi-

viduality only exists to a noticeable degree among species, and among individuals of the same species but few distinctions can be traced. Continuing up the scale of being, we will find that the higher we ascend the greater becomes those peculiarities which distinguish individuals of the same species one from the other, and the highest Individuality or Personality is reached in Man. Again, there are fewer distinguishing traits among savages than among civilized men, and among civilized men Personality reaches its maximum with those individuals who are marked off as men of genius. Thus, the higher we mount in the scale of being the greater does Personality become as measured by peculiarities of attributes. Again, if we analyze our notions of Personality as measured by Independence or Freedom, the same truth impresses itself upon us. In the inorganic and vegetable kingdoms volition or personal independence of action is absolutely nil; and so faintly is it manifested in the lower walks of the animal kingdom that we would be scarcely justified in ascribing personal volition to the animal creation until we had reached quite a height on the tree of life. The higher we climb the more does personal volition enter as a factor into the life of the animal, rendering it more and more capable of extending the limits of its environment. In Man this personal volition reaches its maximum, and in him environment has also reached its maximum, for he covers the face of the habitable globe. It is a well-known law of physics that "*action and reaction are equal and opposite*," so in the organic world improvement of environment insures improvement of the environed, and this improvement of the environed reacts upon the environment, and so the two develop together. With the growth of human Intelligence freedom of action becomes more and more marked. The lowest savages, in their manner of life and in the degree of their dependence upon natural forces, remind us of the higher brutes. As civilization develops, this enslavement to nature becomes less and less, and volition, in modifying environment, becomes more and more conspicuous. This extended freedom is rendered still more apparent when we remember that he makes use of these same natural forces to which he was once in bondage to neutralize their effects upon himself, thus converting the devastating powers of nature into beneficent allies to further his advancement. He has literally captured the lightning, and this, which is of all the

agents of nature the most terrifying to the savage mind, now becomes his faithful messenger, carrying his behests to the uttermost ends of the earth.

> "For lo! the fall of ocean's wall
> Space mocked and time outrun;
> And round the world the thought of all
> Is as the thought of one!"

Climate is modified by the artificial adaptation of natural agents; and the pestilential marsh, carrying on its breath the seeds of death, is reclaimed and made to contribute to man's material well-being. In whatsoever direction we turn our eye we behold the fulfillment of the command: "Be fruithful, and multiply, and replenish the Earth, and subdue it."

This growing freedom from natural bonds, so conspicuous in his material progress, is still more conspicuous in his increasing moral freedom, or freedom from the enslavement of personal appetites. Man, in the mass, is becoming more and more an Intellectual Being, and less and less dependent upon the lower elements of his nature for happiness and pleasure. The power of discriminating between Right and Wrong, according to some accepted standard, (an attribute peculiar to Man,) initiated the first step in Moral freedom. When, in the progress of his upward growth, man had reached that point in his development which enabled him to receive higher truths, then the shifting and imperfect standards were replaced by a *revealed* perfect standard, and his emancipation from personal appetites became still greater. In the fullness of time this Perfect standard received its full interpretation and fulfillment in the Person of the Perfect Man, Jesus Christ; and now the last manacles which bound man to his brute nature were severed forever, and the way was opened up for the attainment of still higher freedom. In the person of Christ we recognize the fullest Personality which has ever appeared on the theater of the world, and in Him we behold the most complete Freedom and the most extended *environment.* The whole range of human sympathy He made His own, and He showed how completely man's lower wants can be held in subjection by his higher. Here, then, we have the most exalted type of Personality which the human mind has ever been called upon to contemplate; and in Him we see fulfilled to a higher degree than ever before the requirements of the definition of Per-

sonality which has been given. Thus by gradual steps do we rise to the apprehension of the Great truth that Perfect Personality can alone reside in the Uncaused Being, for He alone possesses ABSOLUTE Independence, and attributes which no created being can possess.

It will be seen that the conclusion here reached in proof of the Personality of the Deity supports and is supported by the argument for Design. The key-note of both is Absolute Freedom unfettered by the bonds of Necessity, notions of which are always generated in the mind by the Contemplation of LAW in Nature.

It is obvious, then, that in formulating our ideas of the Uncaused Being, our *Symbols must be taken from our highest conceptions.*

Is what *we call* Intelligence *higher* that what *we call* Non-Intelligence?

Is what *we call* Personality *higher* that what *we call* Impersonality? (*i. e.*, is the thing called man higher than the individual atoms which enter into his make-up?)

Is what we call Design or Purpose higher than Law or Necessity, which cannot foresee, nor is conscious of the results of its own action?

Is the consciousness of Self-existence higher than the Unconsciousness of Self-existence?

In determining the answers to these questions, it is impossible for any mind that is capable of appreciating the just relations of things to fall into error.

Now, as it is our bounden duty to reverently contemplate the ultimate cause of things to whom we owe existence, and as it is impossible, in the very nature of things, for the mind to contemplate that of which it forms no conception, it becomes absolutely necessary for us to attempt to form some conception, however imperfect, in order that such contemplation may be possible.

Having satisfied ourselves that we are to think of Him, not as a *negative* quantity or blank to be represented by Zero, but as a *positive* quantity which numbers are powerless to express—not as the *shadow*, but as the very light itself—our course becomes plain. Taking the highest attributes of which we can form any conception, and prefixing Infinity to each, we thus arrive at the *apprehension* (not comprehension) of an Infinite, Personal, Intelligent, Non-Material Being, the Creator and Sustainer of all things.

The recognition of the true relations of things is a definition of Sanity, and failure of the mind in this regard, when carried to certain lengths, is called insanity. Where the practical affairs of life are concerned it becomes of the utmost importance to material well-being that a just recognition of the true relations of things should exist in the mind of every responsible member of society. The man who insists on mistaking another's property for his own, and who, on every possible occasion, violates the established rules of decency and order, will be promptly cared for, either as a criminal or as a "*non compos mentis.*" But in matters of opinion only, wider latitude is given, and a man may indulge in the most extravagant fancies under the name of philosophy without endangering his personal liberty or being considered a proper subject for medical treatment. Many a man has been eulogized as a profound thinker and philosopher, who, had he exhibited the same degree of erratic judgment in the practical affairs of life, would have been relieved of all responsibility. Mill charged Comte with being insane. But, all the while, Mill himself was floundering in the mazes of his own inconsistencies, and failed to recognize the fact that Comte was simply carrying his mad system to its legitimate ultimatum.

The inconsistencies of Mr. Spencer are absolutely startling! He calls his system one of Evolution, yet by his own confession (see pass. from F. P. already quoted) it is one of Involution. He uses the word Dissolution as antithetical to Involution, to describe the contrary process which has preceded and which must follow Involution. These two alternating states compose the sum total of existence.

He often speaks of a First Cause, yet he identifies the material Universe and everything connected with it as *one* with this first cause. His first cause thus ceases to be a cause at all, for he denies that the Universe ever had a beginning. The conditions of Involution and Dissolution are alternately cause and effect for one another, and the *cycle* from the beginning of a period of Involution to the completion of a period of Dissolution constitutes a *rythmical pulsation* of the Universe. As such a rythm comprises the *totality* of existence, it can have no Cause, unless it be said to cause *itself*, which is an absurdity. Such a thing as First Cause is, therefore, wholly at variance with Mr. Spencer's system.

He says (First Principles, p. 551,): "For if, as we saw reason to think, there is an alternation of Evolution [Involution] and Dissolution in the TOTALITY of things—if, as we are obliged to infer from the *Persistence* of Force, the arrival at either limit of this vast rythm brings about the conditions under which a counter-movement commences—if we are hence compelled to entertain the conception of Involutions [his Evolutions] that have filled an immeasurable past, and Involutions that will fill an immeasurable future, we can no longer contemplate the VISIBLE creation as having a definite *beginning* or end, or as being *isolated.* [By which he means to say that it has not been created, that is, *Uncaused.*] It becomes *unified* with ALL existence before and after."

His system being Pantheistic, (which is but another name for Atheism,) either the Universe as a whole must be worshipped, or the *highest* thing known must be selected to represent the whole, or the religious sentiment must go entirely by default. Comte was also a Pantheist, but looking upon Man as the most exalted *known* part of his Universe God, he very consistently selected human nature as an object of worship. Whilst no *healthy* mind can accept such nonsense, still he was but carrying out his absurd system to its legitimate conclusion. And now those who had followed him in his annihilation of a Creator refused to take the final step with their more courageous and consistent leader, but, doubling upon their track, were left without any object of worship whatsoever.

Mr. Spencer, in reference to our mental make-up, says (P. Psychology, Vol. 1, p. 504,): "The aggregate of feelings and ideas constituting the Mental I, have not in themselves the principle of cohesion holding them together as a whole; but the I which continuously survives as the subject of these changing states is *that* Portion of the Unknowable Power which is *statically* conditioned in special nervous structures pervaded by a *dynamically conditioned* portion of the Unknowable Power called Energy."

Again, on p. 217, First Principles, he says: "Various classes of facts thus unite to prove that the law of metamorphosis, which holds among the physical forces, holds equally between them and the mental forces. Those *modes* of the Unknowable which we call *motion*, *heat*, *light*, *chemical affinity*, &c., are alike transformable into each other, and into those *modes* of the Unknowable which

We may conclude this chapter by urging the necessity of accepting the following positions:

If there be a Supreme, Uncaused Being, who stands in relation to the Universe as a Cause or Creator, it becomes our bounden duty to contemplate this Being with reverential awe and render unto Him true worship. But, in order to contemplate, some attempt must be made to embody a conception. In forming this conception, we must first determine which are our highest conceptions. Having done this, we clothe this Being with these attributes, but so qualified as to take them beyond the sphere of all limitations.

We are, therefore, to think of this Being as Infinite, not as Finite.

We must think of Him as Intelligent and Spiritual, (*i. e.*, non-material,) not as Unintelligent and Material.

We must think of Him as Personal. not as Impersonal.

We must think of Him as Conscious of His own acts, not as Unconscious.

We must think of Him as a Free and Spontaneous Causative Power, not as an *inexorable* Necessity (our notions of which have been derived from the action of Law in nature) which *must* act, and which is not conscious of the results of its own actions.

But having done all this, having stretched our limited faculties to their highest bent, we may still recognize that we have fallen infinitely short of the Great Reality. But He who laid the foundations of the Universe and prescribed the limits thereof will not judge His creatures for limitations which He Himself has fixed.

CHAPTER XI.

GOOD AND EVIL.

"Whosoever committeth sin transgresseth also the law; *for sin is the transgression of the law.*"—*St. John.*

"The *sting* of death is Sin; and the *Strength* of Sin is the Law."—*St. Paul.*

Two kinds of Good and Evil are recognized among men—Physical Good and Physical Evil, Moral Good and Moral Evil. Though often confounded in thought and speech, they are as widely sundered as the poles and have no affinity one with the other.

The definition of Physical Good is, *that which is beneficial to the material well-being of the individual.* Physical Evil is anything which militates against this. Famine, Pestilence, Tempest, Suffering and Death are all denominated Physical Evils. Moral Good and Moral Evil depend for their existence upon the consciousness of Right and Wrong, as measured by some recognized and accepted standard of conduct. Moral Good consists in *obedience* to this standard, (whatever its nature,) while *willful* violation of it constitutes Moral Evil or SIN.

The essential nature of Physical Good and Evil lies in the ACT itself, whilst the essential nature of Moral Good and Evil lies in MOTIVE. An act may be physically good, but morally evil.

St. Paul tells us, "the *strength* of Sin is the Law," thereby revealing its true nature and reiterating a similar statement of IV Romans, "for where no Law is, there is no transgression." St. John tells us explicitly (see quotation head of chapter) "that Sin is the transgression of the Law."

The *possibility* of Sin rests upon personal Freedom, and presupposes rebellion against recognized authority. One who is *bound* by *necessity* to act in a certain way can be guilty of no Sin, for, when he comes under the law of compulsion, he ceases to be personally responsible, and becomes a mere machine executing the will of another.

Moral Evil or Sin is oftentimes spoken of as if it were a Principle or an Entity in the Universe, but it is obviously nothing more than a condition—a condition of rebellion on the part of a Free Agent. Those who deny Man's Freedom must also deny the possibility of Moral Evil or Sin.

What are known as Physical Evils occur in the established order of nature, and we are not to regard them as "*things which ought not to be*," for this would be calling in question the wise ordinance of the Universe and be recognizing a *radical vice* in the constitution of things. We cannot understand why pain and death should enter into the plan of the Universe, *but their existence carries with it the warrant of their justification.* The Atheist, as well as the believer in a Beneficent Creator, must alike regard the Material Universe as the best that is possible. Inexorable logic compels the Atheist so to regard it, and firm reliance upon Infinite Wisdom leads the Theist to believe it.*

Were we to define Evil as *something which ought not to be*, it is obvious that what we see taking place in external nature, and which are called evils, could not be so regarded.

Whilst the healthy mind, as it surveys the broad bosom of terrestrial creation, may see much that it cannot understand, yet implicit confidence in the First Cause of things will enable it to recognize the universal harmony that runs through the whole. "The *sting* of death is Sin," says St. Paul, thereby teaching us that *death* only becomes *discord* when united with Moral Evil or Sin. But if Moral Evil or Sin be a discordant note in the universal harmony, how did it come into existence? And why is it permitted to exist? The answers to these questions are to be found in the recognition of Man's Freedom of Will. Sin being nothing more than a condition of rebellion, it is obvious that it could not be prevented from coming into existence, nor, once in being, could it

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* Pessimism is one form of Insanity, for it is positive evidence that the individual has lost all just appreciation of the true relations of things, and his brain must, therefore, be in an unhealthy state. A change of scene and society are the best remedies for this mental condition. The writer, as a physician of considerable experience, would urgently recommend this course to all so afflicted—medicaments are of secondary importance, though often valuable adjuncts to the main treatment. Disorders of the digestive apparatus are not infrequent causes of this mental state.

be banished by the mandate of Omnipotence *without Man's Freedom being sacrificed* with it!! The *possibility* of rebellion cannot be separated from our conception of a Free agent, and the moment *this possibility is done away with by Creative Power, that moment Freedom is destroyed, and the creature is reduced from a moral and responsible being to an irresponsible automaton.* THUS THE POSSIBILITY OF SIN MUST ALWAYS REMAIN so long as there is Freedom of action—*i. e.*, so long as there is a responsible creature in the Universe.

How a created thing could be endowed with *Freedom* is, indeed, a mystery which reason is powerless to solve, but its truth rests upon even higher authority than what we call the reasoning faculty; the consciousness of personal freedom is an intuitive Principle which has its seat in the breast of every rational creature, and the *Presence of this Principle makes him what he is!* There are axiomatic truths in Geometry beyond which reason cannot penetrate; so in moral science there are certain eternal Principles which must be accepted, for they are inseparable from consciousness, and we cannot so much as imagine ourselves existing without them. Conscious Freedom is the great axiomatic truth upon which our whole moral being rests, and the denial of it is the denial of the possibility of Morality!

And here, indeed, reason, which was before powerless, can at least lend us a helping hand by pointing out the *necessity* for Man's Freedom. Metaphysical Sophistry may so warp the mind as to induce it to question this great truth. From this unhealthy state it may find relief by remembering that without freedom morality could not exist.

Accepting the great truth of Man's Free Agency, the existence of Sin or Moral Evil is no longer a mystery—*the recognition of the one is a solution of the other.* Destroy Freedom on the part of the Creature, and Sin is destroyed. The allegory of the Garden, in recognizing the *Sameness* of Sin and Disobedience, carries with it a distinct enunciation of Man's Freedom; for how can there be *disobedience* lest freedom of action be granted?

The prevalence in external nature of what are called evils, the tempest, the pestilence, the earthquake, and the universal carnage which we see taking place throughout the lower creation, where the weaker are constantly made victims by the stronger, has always

we distinguish as sensation, emotion, *thought;* these, in their turns, being directly or indirectly re-transformable into the original shapes." These passages carry with them an unmistakable recognition that the Mental I is a MODE of Being (not, mark you, merely a manifestation) of his Unknowable or Ultimate Power. Now, if Mr. Spencer acknowledges, which he does, that the Mental I is the highest form of this Ultimate Power which he can apprehend, there is no choice left him but to worship himself and others like himself, or to worship nothing. From whatever point of view we examine his system the most glaring inconsistencies stare us in the face.

In his reply to Mr. Martineau's criticism, he is guilty of a degree of affectation and unfairness which lays him open to the charge of disingenuousness. He says: "Speaking for myself only, I may say that, agreeing with Mr. Martineau in repudiating the Materialistic interpretation as utterly futile, I differ from him simply in this: that while he says he has found another interpretation, I confess that I cannot find any interpretation; while he holds that he can understand the Power which is manifested in things, I feel obliged to admit, after many failures, that I cannot understand it. So that, in the presence of the transcendant problem which the Universe presents, Mr. Martineau regards the human intellect as capable, and I as incapable." His assertion that he is not a materialist *goes for naught* in face of the fact that he *unifies* what he calls the Material Universe with his Ultimate Power; all Existence being simply Modes of this Ultimate Power. Mr. Spencer's denial of Materialism is merely a *denial that he can understand the ultimate nature of matter;* but Mr. Spencer would be the last person to deny that what we call matter has a real existence. Now, the question of Materialism lies just here; if I *identify* what I call the Material Universe with the Ultimate Power, then my conception of that Power becomes a Materialistic one, and I am a Materialist. It will be seen that the *ultimate nature* of what we call matter does not enter into the question at all. Matter is a name which we give to that *something which impresses us as occupying space;* and, if we believe that this Something and the Uncaused Cause are *one* and the *same*, then we are to all intents and purposes *Materialists.* That such is the nature of Mr. Spencer's belief he cannot deny, for the foundation of his whole system

rests upon this interpretation; and, furthermore, he confesses as much, as the reader may judge from passages quoted.

His attack on Mr. Martineau for giving a *Spiritualistic* interpretation of the First Cause was most unjust; for the ascription of a Spiritual nature to the Ultimate Power *was not* an affirmation that Its ultimate nature was thereby determined, but merely a denial that It is what we call Material. As clearly shown in the second chapter of this work, when we define a thing as Spiritual in Nature we merely affirm that it is not what we call Material. The definition is, therefore, a negative one, and defines not what it IS, but what it is NOT. The Soul of Man is often referred to as a Spiritual substance, but no one would ever think of interpreting this to mean that the substance of the human soul was identical with the Ultimate Nature of the Creator. After this unwarrantable interpretation of Mr. Martineau's attitude, he goes on to say: "If there is such a thing as the Pride of Science, it is obviously exceeded by the Pride of Theology. I fail to perceive humility in the belief that the human mind is able to comprehend that which is behind appearances; and I do not see how piety is especially exemplified in the assertion that the Universe contains no mode of existence higher in nature than that which is present to us in consciousness. On the contrary, I think it quite a defensible proposition that humility is better shown by a confession of incompetence to grasp in thought the cause of all things; and that the religious sentiment may find its highest sphere in the belief that the Ultimate Power is no more representable in terms of human consciousness than human consciousness is representable in terms of a plant's functions."

Had Mr. Spencer never written anything but this—had he never attempted the truly Herculean task of explaining all about this wondrous Universe—how the present order of things had been preceded by a period of Dissolution, which, in its turn, had been preceded by a period of Involution, and so on to an infinite past; and how the present period of Involution will be followed by a period of Dissolution, and this by another period of Involution, and so on to an Infinite future—I say, that if Mr. Spencer had not undertaken to explain the workings of the Totality of things, the above paragraph might influence us to believe that of all men he was the most humble, and that his reverence for the Ultimate

Power was so great that he considered it desecration even to attempt to contemplate it. But, in the face of his whole system—in the face of his often reiterated statements that the Universe is one and the same with the Ultimate Power, "and cannot be thought of as *isolated* from it"—in face of the fact that, in attempting to circumscribe the Totality of existence, *he has been all the while attempting to circumscribe this Ultimate Power*—in the face of all this, what are we to think of this paragraph?

Mr. Spencer, in his criticism upon Sir W. Hamilton and Mr. Mansel, who maintained that it was our *duty* to think of the First Cause as an Infinite Personality, says (First Principles, p. 108,): "That this is not the conclusion here adopted, needs hardly to be said. If there be any meaning in the foregoing arguments, duty requires us neither to affirm or deny personality." Which, being interpreted, means that duty requires that we should not attempt to contemplate the First Cause at all! He then continues, on the next page: "This, which to most will seem an essentially irreligious position, is an essentially religious one—nay, is *the* religious one, to which, as already shown, all others are but approximations." Now, as Mr. Spencer has told us that we are not to think of the Ultimate Power as Personal, nor yet as Impersonal, it is evident that we are *not to try to think of it all;* and NO sentiment becomes the "*true*" religious sentiment.* It is very obvious that *what* Mr. Spencer calls the religious sentiment is merely a negation of all sentiment; and no effort to contemplate the author of our being

* The utter *emptiness* of Mr. Spencer's position with reference to this great question is so well set forth by Mr. Harrison, himself a disciple of the erratic school of Comte, that I can do no better than to quote from him: "How mere a phrase must any religion be of which neither belief, nor worship, nor conduct can be spoken! Imagine a religion which can have no believers because, *ex hypotheosi*, its adepts are forbidden to believe anything about it. Imagine a religion which excludes the idea of worship because its sole dogma is the infinity of Nothingness. Lastly, imagine a religion which can have no relation to conduct, for obviously the Unknowable can give us no intelligible help to conduct, and, *ex vi termini*, can have no bearing on conduct. A religion which could not make any one better, which could leave the human heart and human society just as it found them, which left no foothold for devotion and none for faith, which could have no creed, no doctrines, no temples, no priests, no teachers, no rites, no morality, no beauty, no hope, no consolation; which is summed up in one dogma—the Unknowable is everywhere and Evolution is its prophet. This is indeed to *defecate* religion to a *pure transparency*."

is the *true* religious attitude, compared with which all other are but "approximations!" We *may call* black white, and negative positive, but they remain the same in spite of the change of name!

On page 123, (First Principles,) occurs the following passage, referring to every man's right to express and act up to his opinions under all circumstances, which, while very consistent with the general tenor of his system, is still extremely inconsistent with the quotation last cited: "He, like every other man, may properly consider himself as one of the myriad agencies through whom works the Unknown Cause; and when the Unknown Cause produces in him a certain belief, he is thereby authorized to profess and act out that belief."

In other words, every individual, being part and parcel of the Unknown Cause, his thoughts and actions, *whatever they may be, are equally right* with those of every other. Why, then, should Mr. Spencer consider himself as holding "*the true*" religious sentiment, thereby implying that so many others hold a false one? Why should he arrogate to himself such a high privilege over the rest of mankind after affirming, in so many words, that *every* man is the *impersonation* of a part of the Ultimate Power? Does he mean to assert that some parts of this Ultimate Power are more capable than others of *forming a true estimate of Itself?* Whence did that portion of the Ultimate Power called Herbert Spencer receive the warrant for assuming to itself superiority over other parts of the Ultimate Power similarly conditioned?

The moral consequences entailed upon society by the universal acceptance of the ideas embodied in the above passage would be simply frightful! Every man being a Law and a god unto himself, his acts, whatever their nature, would be as right as those of every other. The midnight assassin, his hands reeking in the blood of his victim and his heart blackened by every foul thought, could justly affirm that he was the moral equal of him who led a pure and devout life consecrated to the highest aims; for is he not, as much as the other, a part of the Ultimate Power? Mr. Spencer, whose whole life has been a pure and irreproachable one, would be the first to resent this application of his theories, but that such are the conclusions which naturally flow from them I cannot see how any one can deny.

CHAPTER XII.

ATHEISM.

"The Fool hath said in his heart, there is no God."—*David.*

"* * * how turn ye again to the weak and beggarly elements, whereunto ye desire again to be in bondage."—*St. Paul.*

The tremendous tide of Atheistical belief which is now deluging the scientific world, and through it the uneducated classes, is the direct outcome of a false interpretation of the doctrine of Evolution.

The scientific inquirer, accustomed to deal with material things and to express all his ideas in terms of Matter and Force, is too often insensibly drawn from the contemplation of the spiritual, and gradually comes to ignore its existence. Puffed up with arrogance at what they have accomplished, these so-called lovers of wisdom "attempt to fly up to the secrets of the Deity on the leaden wings of the senses," and treat with contempt *that* within them which can alone enable them to soar aloft. Fettered by material bonds, they sink deepest when they deem their flight the highest.

Many of the most intelligent and successful workers in practical science see nothing in this broad Universe but an assemblage of *atoms*, uncaused and eternal, reacting upon one another in *obedience to laws which they themselves have Evolved.*

The existence of a Being who is not the Universe is positively denied, or altogether ignored (which comes to the same thing) as a Being of whom we know nothing and can know nothing, and in whose existence we have no concern.

The word *Athesim* is derived from two Greek words (*a*, without, and *Theos*, God,) signifying *without God.* The well-deserved odium which attaches to this word has induced many whose systems are Atheistical to substitute other words to express their belief. Hence the prevalence of the words Pantheism, Agnosticism, and Monisticism.

Pantheistical notions have, indeed, existed from the earliest

times, but were classed under the general name of Atheism.* The word is derived from *Pan*, all, and *Theos*, God, and signifies that *all existence* is God.

About the year 1705, Toland established a society which took the name of Pantheist, because its members professed to Worship All Nature as their Deity; and since that period and up to recent times, the word has, for the most part, supplanted "Atheism" to distinguish this system of thought.

The distinction between Pantheism and Atheism is obviously but one of *Name*. Both look upon the Universe as the One Uncaused Existence. The Pantheist calls this existence a God, whilst the Atheist abstains from giving it any distinctive title other than the Universe.

It is clear, therefore, that the distinction between the two is simply in the *name*.

The word "Agnosticism" (Gr. *a*, without, and *gnosis*, knowledge) has come into very general use of late years, and has almost driven out the other two.† It is intended to convey the notion that we have not and can have no knowledge of the existence of a Being who is not the Universe. It asserts, therefore, that the Universe *may be*, and *probably is*, all-sufficient of itself, and that we have no just right to believe that it has been *Caused*. In a word, if it does not deny, it does not *believe* in, the existence of a Deity who is the Author of the Universe, and holds that such knowledge is forever unattainable.

This philosophy, or rather system (for it is not worthy of the glorious name of philosophy) is, therefore, literally *without* God, and is, in its essential nature, absolutely indistinguishable from Atheism. The attitude of the mind is one of *unbelief*, or *passive negation*.

The word "Monism," or "Monisticism," which expresses the

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* Spinoza was the author of the most elaborate Pantheistical system of modern times.

† The word "Agnostic" is subject to two very different interpretations. It may mean a confession of our inability to comprehend the ultimate nature of the Deity; and, in this sense, every devout Theist is an Agnostic. But the word is never used in this sense, and it has become identified with that system which teaches that we can have no *apprehension* of the *existence* of a Being who is not the Universe, that is, of a Creator.

belief that All Existence is an *indivisible whole*, a "Monon" is also much in use with those who advocate Atheistical principles. The old word Atheism has become so obnoxious from its vicious associations that those theorists, many of whom are irreproachable in their moral conduct, are only too glad to dress up the "Old Hag" in any garb which will conceal her aged deformity. But plume her as they will, her nature remains unchanged; and it requires but a superficial eye to penetrate beneath her specious outside and detect all her native ugliness. It is curious as well as instructive to note with what regularity these tidal waves of Atheistical belief have swept over the civilized world, and their appearance, with almost cyclical regularity, might justify us in believing that there is some law governing their recurrence.* But with the recession of every new wave, more firm ground is lifted above the reach of the waters; and we may cherish a reasonable hope that the accession will continue until the whole domain of truth has been wrested from the dark and tempest-tossed waters of error. "From evil much good may come;" and the shafts aimed at the very life of truth may oftentimes render her invaluable service by tearing away the wrappings of error in which misguided Zeal has infolded her, thus enabling all mankind to behold and appreciate her wondrous beauty.

A superficial survey of the history of Speculative thought from the time of the Greeks enables us to lay down *at least six* periods distinguished for the prevalence of Atheistical belief:

1st. The Middle Greek period, of which the chief representatives were Leucippus and Democritus. Their errors were combated and refuted by Plato and Aristotle.

2d. The Later Greek period, in which the errors of the preceding age were revived by the skeptics, and did much to counteract the sublime truths of Plato and Aristotle. The followers of Epicurus, perverting the theories of their master, established a sect which became the shame of the human race, and Epicurianism became a synonym for all that was low and sensual. The rise of the Alexandrian School of Neo-Platonists, under Philo and others, did much to

* The dawn of every scientific revival has been obscured by the mists of scepticism, but these noxious vapors have always been dispelled as knowledge approached the zenith.

stem this torrent. But the advent of Christ, and dissemination of His teachings, did more than all else to open the eyes of men to their moral depravity, and to lead them to the contemplation of higher things.

3d. The Mediæval period, in which the Church itself was invaded by unbelief, and became a hot-bed of theoretical as well as practical atheism. A period when the dagger and the poisoned cup were oftentimes the readiest means to obtain the papal crown; when Rome became such a cess-pool of iniquity, that the good and the wise, fleeing from its polluted atmosphere, sought the retirement of the convent or the caves of the mountains, and spent the remainder of their days in ascetic devotions. The depositaries of sacred things becoming apostates to their high calling, had instituted a reign of crime and blood unparalled in the history of the human race. And now, when the whole moral world seemed verging on dissolution, when Atheism, under the guise of religion, was working such wide-spread ruin, a reaction began to set in, which culminated in the emancipation of religion and full establishment of the Reformation. Atheism has never since regained its high position in sacred places, nor wielded such a potent influence for evil.

4th Period. The sixteenth and seventeenth centuries gave birth to much Atheistical literature, but these speculations were ably combated by such men as Bacon, Harvey, Descartes, Locke, and others. Addison, writing about the year 1712, notes the decline of Atheism in his day: "It has been attacked with so good success of late years that it is driven out of all its outworks. The Atheist has not found his post tenable, and is therefore retired into deism and a disbelief of revealed religion only. But the truth of it is, the greatest number of this set of men are those who, for want of a virtuous education, or examining the grounds of religion, know so very little of the matter in question that their infidelity is but another term for their ignorance. As folly and inconsiderateness are the foundations of infidelity, *the great pillars and supports of it are either a vanity of appearing wiser than the rest of mankind*, or an ostentation of

been a favorite theme with those who deny the existence of a Beneficent Creator. Thus, Mr. Spencer, in referring to this subject, says (P. Biology, Vol. I, p. 344): "With the conception of *two* antagonistic powers, which severally work good and evil in the world, the facts are congruous enough. But with the conception of a Supreme Beneficence, this gratuitous infliction of misery on man, in common with all other terrestrial creatures capable of feeling, is absolutely incompatible." One might imagine from this passage that Mr. Spencer was a believer in the doctrines of Zoroaster, who taught that there are two Principles in the Universe Ahriman, the Good, and Ormuzd, the Evil. The Good Principle, we are told, sprang from the *Eternal Essence* itself; but where Ormuzd came from does not appear. We are also told that Ahriman is finally to overcome Ormuzd, who is to be thrown into outer darkness. To criticise an ancient and false religion by the standards of the nineteenth century would be folly. But when a system of philosophy, worked up by the light of this same nineteenth century, calmly tells us that the only explanation of the existing order of things is on the theory that there are two antagonistic and irreconcilable Principles in the Universe—two separate and distinct Uncaused Powers who divide the whole between them —the novelty is somewhat startling. This would, indeed, be recognizing a radical vice in the constitution of things, which he elsewhere takes some pains to show cannot exist. It is obvious that Mr. Spencer cannot believe what this passage conveys. What, then does he mean? Whilst denying the existence of a Supreme Beneficence, he still seems to recognize such things as Good and Evil. His Ultimate Power, which he holds to be *one* with the Universe, thus seems to be made up of two opposite principles constantly warring one with the other. But why should the one be called Good and the other Evil? Are they not both simply Modes of his Ultimate Power? Why then this splitting up of the Ultimate Power into two opposing Principles? One part of the Ultimate Power cannot consistently be preferred over the other! Obviously, there is a net-work here before which his theories are powerless. And here Mr. Spencer's whole moral system is undermined and left without a vestige of a foundation to rest upon. In denying that mankind is possessed of a moral standard revealed unto it by the Ultimate Power, and in affirming that Man and all

things else are but Modes of this Ultimate Power, he thereby denies that there can be anything like moral evil among men; for if there be no moral law to violate, there can be no moral evil. His system can recognize no other form of Good and Evil than that which is embraced under the terms Physical Good and Evil, and which, as already defined, depend upon Material *Expediency* and *Inexpediency* for their existence.

According to him, there is no distinction between the Evil brought about by the tempest and the Evil committed by a human being who, possessing the full light of the Law, deliberately assassinates his fellow-man. To be consistent, he should regard the one with the *same feelings* that he does the other. The tempest and the murderer are alike Modes of his Ultimate Power: both destroy human life, and both fill us with horror and dread. I repeat that Mr. Spencer's system can make no distinction between them. But what says that Something within us which we denominate the Moral Sentiment?

A sense that a just and righteous law has been violated, that a crime has been committed, is uppermost in our minds when we contemplate the assassin which has no place when we regard the wholesale destruction caused by the tempest, the pestilence, and the famine.

Mr. Spencer cannot recognize in the Physical evil that the Universe presents anything *which ought not to be*, for this would be confessing a *radical vice* in the constitution of things, a position which no sane mind can hold. Now, inasmuch as he recognizes but *One* kind of Evil, that of physical consequences, it necessarily follows that *All* things, man's thoughts and actions included, are just exactly what they ought to be. The actions of what we call the immoral man are thus precisely on the same footing of absolute right as those of the most conscientious among us. Thus all things are reduced to a dead level of indifference; for the good of his system, like its Evil, is nothing more than a different mode of his Ultimate power. The result of his system is, therefore, to destroy all morality, for it makes man an irresponsible agent, a mere automaton; while, at the same time, it offers no better solution for the existence of Physical evil than the system which recognizes a Beneficent Creator. This, too, looks out upon external nature, and, with wise humility, *sees in it nothing which ought not to be*, for

it relies with implicit confidence upon Him who brought all things into being. Only in the condition of disobedience on the part of Man does it recognize a *discord* in the Universal harmony; but it also teaches that this *condition* cannot be done away with by the fiat of Omnipotence, without man, as a *rational creature*, being annihilated with it.

The *possibility* of *rebellion* necessarily enters into the constitution of a Free Agent, and this is the foundation upon which all *true* religion must rest.

The highest goal to which man can aspire, and to which all else must be subordinated, is the realization of a "Just Life" and the full development of that part about him which he looks upon as the highest. The philosophy which does not contribute to the compassing of this end proves false to its name, for the word was coined by the old Greeks to designate a "Lover of Wisdom."

Any system of thought which, in its estimate of man and his relations to the Author of his being and to his fellow-man, fails to take into account that inner Something which no language can express and which makes him what he is, should not receive the name of Philosophy.

The harmony which exists between the revealed moral code and the best material interests of man may enable such a system of thought to *verify* its utility, but the Spirit which gives it life cannot be apprehended or appreciated—religion with its accompanying moral sentiment can alone do this. The Life that is chiseled out mechanically along the lines of material expediency may thus very nearly resemble in *outward form* that which springs from the moral sense, but in essence they are as widely separated as the Antipodes. In the eyes of the one, the "widow's mite" sinks into unutterable contempt; with the other, this mite infinitely outbalances the rich man's glittering gold.

The morality which springs from Religion and the morality which springs from this so-called philosophy bear the same relation to one another that an Egyptian mummy does to a man in the hey-day of his youth and strength.

He who attempts to discover the essential nature of morality by the light of material expediency alone will fare about as well as he who gropes, with scalpel and microscope, among the cells and

fibers of the brain in search of the faculty of Intelligence.* Philosophy divorced from Religion may be compared to an eagle with its wings clipped; its home is, indeed, on the heights and its legitimate sphere the realms of light, but shorn of that which enables it to soar, it must needs grovel, and soon loses all nobility and glory.

* "We cannot discover any such practical interest arising from pure principles of reason as morality and religion present. On the contrary, pure empiricism seems to *empty them* of all their power and influence. If there does not exist a Supreme Being *distinct* from the world—if the world is without a beginning, consequently without a Creator—*if our wills* are not free, and the soul is divisible and subject to corruption just like matter—the ideas and principles of morality *lose all validity*, and fall with the transcendental ideas which constituted their theoretical support."—*Kant, Critique of Pure Reason; translated by Meikle John.*

courage in despising the terrors of another world, which have so great an influence on what they call weaker minds; or an aversion to a belief that must cut them off from many of those pleasures they propose to themselves, and fill them with remorse for many of those they have already tasted."

5th. The Fifth Cycle reached its acme during the latter part of the last century, and attained its greatest strength in France. The evils of the French Revolution, though directly the result of bad government and oppression, were no doubt immeasurably aggravated by the wide-spread influence of Atheistical teachings. Atheism engrafted on illiteracy and superstition form a combination which staggers the mind to contemplate. The crimes of the French nation were expiated by the blood of thousands of its best citizens, and the terrible storm seemed to have had a purifying effect upon the *morale* of the whole people, for Atheism lost much of its popularity.

6th. The tidal wave which is now upon us is really a continuation of the preceding cycle, to which a new impetus has been given by the establishment of the theory of Evolution, and a false interpretation of the same. The condition of society throughout Europe to-day has many points of resemblance to that which existed in France during the latter half of the past century. "Nihilism" is the offspring of oppression fostered by Atheism. "Neither God nor King," is the motto which they have written in characters of blood upon the standard which pollutes the pure breezes of heaven. "Dynamite" is their battle-cry; murder and rapine their watchwords. The fair name of Liberty they have tarnished, and her noble form they have torn from its high pedestal and dragged in the mire.

The would-be philosophers of the day have much to answer for in letting loose the fiends of unbelief upon the world. The holy spirit of Freedom, which teaches man to assert his native dignity and to rise against oppression, they might have guided to the compassing of noble ends; but they have chosen to sow the seeds of Atheism, thereby diverting this grand spirit from its legitimate channels, thus encouraging anarchy and crime. Anarchy and Atheism, with the illiterate, go hand in hand and are inseparable;

and, indeed, what is Atheism itself but Moral Anarchy, where the very foundations of right and wrong are swept away, leaving the conduct of life based upon nothing but the shifting sands of expediency?

Fortunately for the human race, the influence which these speculators exercise is but transitory, and, after the novelty of their doctrines has worn off, that ineradicable principle in man called his moral nature rises up in judgment against them, and they and their doctrines are hurled from their high place in the esteem of men and either consigned to oblivion or to a lasting infamy. No earnest seeker after truth can be permanently misled by their hair-splitting sophistries, and sooner or later the touch-stone of truth which resides within him will reveal the lurking fallacies upon which their theories are based; and, on the other hand, how quickly will it teach him to follow the lead of the true philosopher and prepare his mind for the reception of the highest truths! How surely will it enable him to discriminate between two such writers as Bacon* and Hume, and to recognize in the one the true philosopher, nature's high priest, officiating at her altars with pure hands and devout spirit, earnestly seeking the truth, and imparting it to others with the most exalted consciousness of his high mission; in the other, the juggler, whose highest aim is the plaudits of the crowd before whom he plays his mountebank tricks! Hume, in his "Dialogue on Natural Theology" and "Essay on Suicide," has well illustrated how the most obvious truths may be obscured and distorted by the tricks of the Sophist.

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* Bacon, in his devotion to the cause of philosophy, well redeemed a character before blackened by public mal-administration and disregard of the highest claims of friendship. "Bacon seeking the great seal and Bacon searching for truth were two very different beings."

> "Hapless in his choice,
> Unfit to stand the civil storm of state,
> And through the smooth barbarity of courts,
> With firm but pliant virtue, forward still
> To urge his course; him for the studious shade
> Kind nature formed; deep, comprehensive, clear,
> Exact, and elegant; in one rich soul,
> Plato, the Stagyrite and Tully joined—
> The great deliverer he!"
>
> —*Thompson's Seasons.*

Even were it impossible to arrive at an apprehension of the existence of a Deity by reason alone, (which the writer does not accept,) yet we have that moral consciousness of his existence which, in certainty, transcends the powers of logic; for, says Descartes, "J'ai tiré la preuve de l'existence de Dieu de l'ideé que je trouve en moi d'un être souverainement parfait."

Immanuel Kant, near the close of his great work, the "Critique of Pure Reason," which is largely devoted to adverse criticisms of the arguments usually advanced to prove the existence of the Deity, fully recognized the paramount importance of following the lead and accepting the promptings of our moral nature. He says: "For in this sphere action is absolutely necessary, that is, I must act in obedience to the moral law in all points. The end is here incontrovertibly established, and there is only one condition possible, according to the best of my perception, under which this end can harmonize with all other ends and so have practical validity—namely, *the existence of a God and of a future world.* I know also, to a certainty, that no one can be acquainted with any other conditions which conduct to the same unity of ends under the moral law. But since the moral precept is at the same time my maxim, (as reason requires that it should be,) *I am irresistibly constrained to believe in the existence of God and in a future life; and I am sure that nothing can make me waver in this belief, since I should thereby overthrow my moral maxims, the renunciation of which would render me hateful in my own eyes.*" *

Such is the final verdict rendered by Germany's greatest thinker upon this all-important question. Notwithstanding the overwhelming testimony of our moral nature, there are those who utterly disregard this highest of all proofs, and require supporting arguments from the faculty of logic ere they are willing to acknowledge its truth. One might with justice question their possession of a moral sense, so utterly do they contemn its behests. The power of the reasoning faculty to demonstrate the existence of a God has often been denied, yet the writer is firmly persuaded that this, the greatest of our endowments after the moral sense, has not been so slighted by its great Creator as to have withheld from it the power of proving that Creator's existence. In the preceding pages, we have already advanced arguments to show that what we call the Mate-

* "Critique of Pure Reason," translated by Meikle John.

rial Universe is not adequate to meet the demands of the *Absolute Infinite*, (see Chapter IV.) It follows, as a necessary corollary, that the Material Universe cannot be an Uncaused Existence, for an Uncaused Existence must be an Absolutely Infinite and Unconditioned Being. But if the Universe is not Uncaused, it must have had a Cause, which is itself Uncaused, and in this Uncaused Cause we recognize the Deity. Thus reason, as well as the moral sense, negatives a material conception of the Supreme Being. To those who accept the data which science has given us, the doctrine of Evolution, as interpreted in the foregoing pages, will furnish corroborative proof of the existence of a Being who is not *one* with the Universe.

The strength of this argument lies in showing that the Universe has not always existed as it now presents itself to us, but that it has *gradually grown* to its present state, so that the contemplation of it occasions in the mind the idea of *progress from a beginning.* From a scientific stand-point, we are bound to admit that what we call the Universe has been generated, and if generated, then it has had a beginning and a Beginner.

Let us now examine, by the light of the doctrine of Evolution, the various Atheistical propositions that have been advanced from time to time to explain the nature of things.

1. *The Universe has always existed as it is at the present time.*
2. *Matter and Force are* MODES *of an* UNKNOWN *reality* (Spencer) *and together make up the unknown reality of which the Universe consists.*
3. *The Universe owes its existence to a Force acting upon the matter which existed from all Eternity, but the Force is not an Intelligent Entity.*
4. *The Something we call Matter is the only Real Existence, and perpetual change of place is one of its attributes; and the Something we call Force is merely the sensations which this change of place occasions within us.*

The *first* proposition, that the Universe has always existed as it is at the present time, is positively disproved by the evidences of Geology and other indisputable facts upon which the doctrine of true Evolution rests. This naked assertion, therefore, requires no further refutation.

The Second proposition embodies the Monistic philosophy, and is

that entertained by Spencer, Hæckel, and Atheists in general. It asserts the UNITY of Matter and Force, that is to say, the Matter and Force which make up what we call the Universe, are but modes or conditions of the UNKNOWABLE Reality; and, when considered together, constitute this unknowable or Uncaused Being. This philosophy, therefore, asserts that the Universe is an Uncaused Existence, and, therefore, never had a beginning. Hence, at no time could the process of Involution (so-called Evolution of Spencer) have had a commencement. Now, if the process never had a beginning, it is evident that the Universe must have always existed just as it is, for by the proposition it could never have commenced to be other than what it was originally. For if the contrary be held, then the process had a beginning. Now, a beginning could only take place in a Finite Time, but, by the proposition, Matter and Force, which comprehend the Totality of Being, have existed from eternity; therefore, there must have been Something outside of Matter and Force to set the process going, (for how was it that they had existed from eternity without action, and suddenly commenced to act?) but this outside Something is contrary to the original proposition. The Monistic philosophy, therefore, when carefully examined, really denies that there has been any change in the *original* condition of things. The absurdity of this conclusion is shown by the truths of Evolution. Mr. Spencer, recognizing the difficulties which the facts of Evolution present to the denial of a definite beginning to the phenomenal Universe, attempts to overcome the difficulty by asserting that there "is an alternation of Involution (his Evolution) and Dissolution in the Totality of things," and that "we can no longer contemplate the visible creation as having a definite beginning or end," (First Prin., p. 551.) By which he means to assert that this period of Involution will be followed by a period of Dissolution, which, in its turn, will give place to another period of Involution, and so on in an endless cycle of ever-recurring changes. The absurdity of this is at once apparent when we reflect that he postulates existence from eternity for both of these conditions of Involution and Dissolution.

In the *third* proposition we see it laid down that the Universe owes

its existence to two primarily independent agents: a non-intelligent force and the atoms of matter. Both are from all eternity, and are, therefore, equal, for as neither gave origin to the other, the one cannot be said to be more powerful than the other. If it be admitted that there was a time when things were not as they are, then they must have had a beginning. Now, as these two independent and equal agents existed from eternity without acting upon each other, what influenced them so to act at the definite time postulated by the word beginning? It is obvious that a *third* Something came into play and brought about a union of the two; but this *third* Something, by the proposition, did not exist, hence there could have been no beginning; but if there was no beginning, then the Universe has always existed as it is, and the absurdity of this has already been shown.

The Fourth proposition asserts that the Something we call Matter is the only real existence, and that perpetual change of place is one of its attributes; and the Something we call Force is merely the sensations which this change of place occasions within us. This proposition, as well as the third, are really but different ways of wording the second. The inadequacy of what we call matter to fill up the definition of absolute Infinity or Uncaused existence has already been sufficiently demonstrated. Moreover, according to this proposition, there could have been no beginning to the visible Universe, for this would presuppose something outside which induced the change from the *original eternal* state in which matter existed. But this outside Something is contrary to the proposition. The Universe, therefore, must have been as it is now from all Eternity, and the absurdity of this has already been demonstrated.

Thus Atheism, however it be worded, is reducible to the same summing up.

We are thus forced of necessity to fall back upon the Existence of a Supreme, Unconditioned Will Power, the Author and Sustainer of all. We are compelled by all the laws of reason to regard the act of Creation as a Free Will act, that is to say, the visible Universe cannot be conceived of as existing through *Necessity*, but through the absolute Free Will of an absolutely unconditioned

Being. Mr. Spencer, in confounding the Universe with his Unknowable, is thus driven by necessity to deny that it ever had a beginning. But when we regard the visible Universe as merely the manifestation of an Absolute Will, and are careful not to confound *the effects* of this Will with the essential nature of the Power which exercised the Will, then the difficulty disappears, and we can conceive of the Universe having a beginning.

If from the scientific the mind turns to contemplate the moral aspect of Atheism, it is at once enveloped in folds compared with which "the palpable obscure" of Milton is as radiant noon. If, in the face of the arguments adduced above, it still be maintained that we have no logical proof of the existence of a Being distinct from the Universe, yet no one with any claim to powers of reasoning will hold that it can be disproved.

Whilst I look upon the arguments already advanced as absolutely conclusive, still, for the sake of further argument, let it be granted that it is impossible, by means of *Speculative* reason alone, to prove or disprove the existence of a Being who is not the Universe, but the creator of it. The mental attitude will then be one of doubt; there may be or there may not be such a Being; the *logical* arguments in proof of the one being neutralized by equally strong *logical* arguments in proof of the other.

Here, then, we have a condition of equilibrium. Now, if it can be shown that this equilibrium, to which the exercise of pure speculative reason has brought us, can be disturbed by any considerations whatsoever, then we are compelled, in all reason, to accept as truth that side in whose favor the scale turns. The considerations which may be advanced to destroy this Equilibrium of doubt are drawn, not from the province of *Speculative reason*, the arguments of which, on both sides, are supposed to be exhausted, but from the domain of the *Practical*. Is it *advantageous* or *disadvantageous* to the Cause of Right living to accept belief in the existence of such a Being? Has this belief aided or retarded the growth of civilization? The answers to these questions will settle the argument once and for all. Where is the right-minded or moderately well-informed man who will hesitate as to the answer? Will any one have the hardihood to assert that this belief has not been of great advantage to the race, and that disbelief among the Masses

has always resulted in moral retrogression? I appeal to the stern verdict of facts.

Will it be argued that there are many who disbelieve in such a Being who are yet, in all points, conscientious in the discharge of the duties of life? This may be true, but how few their number, and how seldom are they met with beyond the sphere of the schools of thought. Besides, as I shall attempt to show, these men, by whatsoever motives they may be influenced, lead conscientious lives in *spite* of their belief rather than in accordance with it; and there is, with them, no unity or concordance between the conduct of life and the theories which they maintain. There is, indeed, perpetual war between the promptings of their moral sense on the one hand and the teachings of their system on the other. Practically, they are compelled so to adjust their lives as if they looked upon themselves as Free agents and responsible beings, yet they theoretically maintain that they are but links in a chain of inexorable fate, and, therefore, in no wise responsible for the opinions they may hold or the acts which they may commit. The Universe is all in all to them, for they maintain that it has not been created, and that there is no Being distinct from it who has called it into existence. As they recognize the existence of Nothing but the Universe, and as they are compelled to regard themselves as a part thereof, it is obvious that Moral Wrong can have no existence for them, all things being on an equal footing of absolute right. Thus the application of their theories to the conduct of life would necessarily result in the destruction of all morality, to say nothing of religion. The Atheistical philosopher, so-called, by the range of his knowledge and the powers of his understanding, may arrive at the truth that the Moral Law which we all accept is best for the material interests of humanity, and thus *he* may be confirmed in the practice thereof, and be deterred from the commission of deeds which would tend to the destruction of society. But how would it be with the Atheistical ignorant? Loosed from the restraints of laws which he, very justly, recognizes as binding no longer, for the binding force of a law depends upon the law-giver, what is to deter him from pursuing a course of life directly contrary to the Moral Code? State enactment may indeed, and, in a measure, does throw checks around his conduct, by holding out punishment for the violation of the secular law, which is based upon the Moral

Code; but, whilst the fear of punishment by the arm of justice may deter from crime, it cannot lift or moralize the man. Remove the arm of justice or weaken its power, and how soon do the passions of evil men gain the ascendant, converting the community in which they live into a very Hell. Turn your eyes upon the Nihilistic movements of the day and read the motto emblazoned on its blood-stained banner; search out the haunts of vice and crime, and behold the legitimate results of disbelief in the existence of a Beneficent Creator. "*By its fruits shall the tree be known.*" Will any reasonable man, in the face of these incontrovertible facts, dare deny that belief in a Being distinct from the Universe is to the best interests of Humanity? If the Atheist acknowledges, as he is compelled to do, that this belief is in accord with the highest interests of mankind, then sound judgment must lead him to accept the truth of that which lies at the very foundations of the social edifice, and which has enabled man to elevate himself above the brute and assume his proper station at the head of terrestrial creation. Can the belief whose influence and elevating power brought all this about be a false one or make-shift, as Mr. Spencer would have us think? Are we justified in replacing it by a belief which, even in the domain of *speculative reason*, is without a tenable basis to rest upon, and which, in the domain of the *Practical*, robs the moral law of all validity, and confounds all distinction between right and wrong, which, in a word, destroys the very foundations of morality and religion?

Did belief in the existence of a Supreme Beneficence have no practical interest for humanity—were it a subject in which the schools of philosophy were alone concerned—much might be pardoned to an erratic mind entangled in the mazes of speculative reason; but how are we to extenuate cold-blooded attacks upon the very highest interests of the race, in open defiance to truths the weight of which even the most ordinary intelligence can appreciate?

The Pantheist or Atheist, in order to give his position even the air of truth, and to justify his attempt to invalidate the practical considerations adduced, should be able to prove with *absolute certainty* that there is no Being distinct from the Universe. So far from being able to do this, he is unable to maintain his position against the Theist even on the ground of Speculative reason alone.

But even were he able to advance speculative arguments in favor of his position which could not be assailed by any weapons in the armory of pure reason, still I, for one, would rather doubt the validity of the reasoning faculty than question the irresistible promptings of the moral sense, and the incontrovertible testimony furnished by the practical influence of Theistical belief upon the well-being of the race.

It has, indeed, been a most fortunate thing for Humanity that the conservation of this great truth has not been intrusted to the erring reason of fallible men, but so ingrained in their very nature that it is only by willfully closing their eyes that they can shut out the light which comes streaming in upon them on every hand. It does not require the acumen and learning of the astronomer to teach the meanest understanding that the Sun gives light and heat, nor does it require the reasoning of philosophy to persuade men of a truth which they cannot fail to recognize so long as they are true to themselves.

The arguments contained in the preceding pages are, therefore, only for those in whom the beacon's light set up in every soul has been obscured by the haze of doubt engendered by the bogs of Sophistry and Scepticism.

Summary.

Under one or the other of the following headings must all belief concerning the existence of a Supreme Existence be classed: *

Theism.	*Atheism.*
Def.: Belief in the existence of a Supreme Uncaused Being who is not the Universe but the Author of it.	Def.: Belief that the Universe is itself the Supreme Uncaused existence.

For the sake of giving our opponent every possible advantage, let it be granted that, on the ground of pure *speculative reason*, the arguments for the one are neutralized by equally strong arguments

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*The Agnostics, or "Know-Nothings," inasmuch as they do not believe (though they do not deny) in the existence of a Being distinct from the Universe, must be classed with the Atheists, for they are literally without a God.

for the other. The Equilibrium of doubt thus established is still utterly destroyed in favor of Theism by the following arguments, drawn from the domain of the *Practical:*

The experience of all ages and nations teaches that Theistical belief has been most conducive to the welfare of Mankind and the progress of Civilization by:

1. In holding up a conception for human worship which is not subject to the limitations and corrupting influences of the senses, thereby affording unbounded scope for the development and exercise of the religious feelings innate in every human being, thus fulfilling the highest needs of the individual and of the race.

2. In giving validity to the moral law in the conduct of life, thus insuring the most thorough adjustment of the will of the individual to the best moral and material interests of humanity.

The experience of all ages and nations teaches that Atheistical belief has militated against the material and intellectual progress of the Race by:

1. In rendering the religious sentiment null and void by robbing it of a conception which is necessary to supply its wants. Man cannot worship the Universe as a whole, nor yet any part of it. Sound judgment compels him to regard himself as the highest expression of the Universe with which he is acquainted, hence, if he worship anything, it must be himself, but a well-balanced mind cannot accept this conclusion; it is sheer madness.

2. In robbing the moral law of all validity by undermining the principles which give it theoretical support. The mass of mankind are thus left without sure guides to conduct, and all ideas of right and wrong are confounded; and he only can aspire to a life that is in accord with the best material interests of the race, who, by his learning and understanding, is able to *verify* the utility of the Moral Code.

But even in this attempt at verification, he falsifies his own

position, for, whilst *theoretically* confounding good and evil, (words which can have no real significance to him,) he is still compelled to act as if he considered himself a free agent, and responsible for his conduct. Uncompromising warfare is thus established between theoretical teaching and the practical conduct of life.

To the cry, "Whence are we, and whither are we tending?" which has been echoed down the ages since intellect first dawned upon the world, the Atheist has for answer: "Behold the clod beneath your feet and recognize the source from which you came and the goal to which you are tending." When we ask for an intelligent Creator, the Materialist literally gives us dirt! In the ultimate atoms of matter we are to behold our Creator. This dead matter, which we make subservient to all our needs, which we have subjugated and made our willing slave, is our God! For that Something within us which we call intellect, mind, or what you will, the Atheist ascribes no other cause than the action of the atoms and molecules of this dead matter. "The winged words and fiery thoughts of the Poet, the Philosopher, and the Statesman are only the result of the play of atoms." There is no such thing as an intellectual principle; it is merely a natural phenomenon, a result of vital action, and on a par with the rolling thunder and flashing lightning. Says Mr. Huxley, (Belfast address:) "The thoughts to which I am now giving utterance, and your thoughts regarding them, are the expressions of molecular changes in that matter of life which is the source of all other vital action." The affections, love, friendship, duty, honor, are all to be formulated in terms of matter and force. Good and Evil mean nothing more than Expediency and Inexpediency. Our standard of right and wrong is to be measured by utility, and the sting of what we call conscience is nothing more than the uneasiness resulting from a diseased nervous system. There is no room for unselfishness in this philosophy, for the doctrine of Utility is its foundation-stone. The acts of self-sacrifice and heroism which have commanded the

admiration of mankind in all ages of the world were acts of folly or insanity, instigated by treacherous atoms, which, for the time, threw out of gear the mechanism of the brain. And this is the philosophy which the Materialist gives us to nourish our moral needs. When we ask for wholesome diet, we are offered food worse than the apples which grew on the brink of the lake Asphaltes, for they were fair without, though ashes within; but the food which the Materialist gives us is foul without and worse than ashes within.

When we ask the question, "Whither are we tending?" the Materialist points to the narrow grave, and gives us immortality in the ashes which lie moldering there. Human progress and development are to him limited to the narrow span of this state of being, and when this world will have ceased to be, progress and Evolution will have run their course; the great cycle will have been completed, and the wondrous machine of the Universe will be resolved into the atoms which gave it birth.

"Roll on, ye stars, exult in youthful prime,
Mark with bright curves the printless steps of time;
Near and more near your beamy cars approach,
And lessening orbs on lessening orbs encroach.
Flowers of the sky! ye too to age must yield,
Frail as your silken sisters of the field!
Star after star from heaven's high arch shall rush,
Suns sink on suns, and systems, systems crush,
Headlong, extinct, to one dark center fall,
And death, and night, and chaos mingle all!"

—*Dr. Erasmus Darwin.*

It is one of the admitted scientific conclusions of the day that the world which we inhabit is destined to become an arid waste, incapable of supporting the simplest forms of life. We are told by astronomers that the moon has already reached that stage of its existence. The time, therefore, is approaching when the human race and all living things will have ceased to exist, and the surface of the earth, which now teems with sentient beings, will be a vast, silent desert. Living things will probably disappear from the face of the earth in the reverse order in which they appeared; first, Man, and so on down the scale to the lowest animal and plant. The human race, cut off from a future life, dies with the world which gave it birth. Behold a dead world, the grave of all

human effort, hopes, and aspirations! And this is what Atheism gives us when we ask for immortality!

It cannot be denied that the great error of Atheism is to-day espoused by some of the principal leaders of scientific thought. These men have, apparently, deluded themselves into the belief that they are doing the world a great service by tearing down what they are pleased to term the spiritual idols of the race. Their relations in public and private life are beyond reproach, and the moral code by which they guide their own conduct is the same as that of the most orthodox Christian; yet they do not scruple to overturn the only support upon which that moral code rests. Their lives may be models of practical virtue, but they advocate principles which, if lived up to and assimilated, would render society impossible and petrify all the higher emotions of the soul. Where shall we seek an explanation for this extraordinary inconsistency? Accustomed to dwell upon the tangible world of matter which surrounds them, they have come to ignore the existence of that world from whose arsenal they have drawn the weapons which have enabled them to pursue their career of conquest. In adopting the motto* which the wise men of "Solomon's House" formulated for their own guidance, they have forgotten its spirit and have become so intoxicated at the extension of man's dominion over nature that they have lost all sense of the just relations of things, and fly from one absurdity to another. By some he is reckoned no higher than the brutes of the field, whilst others recognize no limit to his power. Some of these blind fanatics have actually Deified him. What are we coming to when one of our would-be instructors gives expression to such a thought as this: "The dim and shadowy outlines of the Superhuman Deity fade slowly away from before us, and as the mist of his presence floats aside, we perceive with greater and greater clearness the shape of a yet grander and nobler figure—of Him who made all Gods and shall unmake them. * * * From the dim dawn of history, and from the innermost depths of every soul, the face of father Man looks out upon us with the fire of eternal youth in his eyes and says, 'Before Jehovah was, I am,'" (Clifford.)

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*The end of our foundation is the knowledge of causes and secret motions of things, and the enlarging of the bounds of human empire to the effecting of all things possible.—*Bacon's New Atlantis.*

Having traced man's origin from the atom, they would now elevate him to the dignity of a God! "O judgment, thou art fled to brutish beasts, and men have lost their reason!"

Under the leadership of such men war is waged against the most sacred things, and on every side we see the hand of the destroyer.

Some of our principal seats of learning are hot-beds of Materialistic teaching, and young men just entering upon life, with all its grave responsibilities, pride themselves on believing nothing which has a religious tendency. They deny the existence of a Supreme Beneficence, for they are afraid of being considered behind the age, but they accept without hesitation all the absurdities of Involution or Atheistical Evolution.

We may arraign the advocates of the theory of Involution or False Evolution before the bar of Truth on the following charges of gross absurdity:

1. They designate their theory Evolution when the process they describe is one of Involution.
2. They assert that the Universe is an Uncaused Existence, yet they affirm that it is subject to progress, and that the seeds of its origin existed in a *previous state of Dissolution.* Dissolution thus becomes the Cause of Involution, and Involution will become the Cause of Dissolution. They assert that the TOTALITY of existence is embraced by both at alternate periods. As far as elevation in the scale of Being is concerned, both are exactly on a par, being merely different modes of Existence which their Universe God assumes, for some of them call the Universe a God, and designate themselves Pantheists.
3. Practically, they regard themselves as immeasurably superior to the dust they tread beneath their feet, whilst they affirm that the atoms and their inherent (unendowed) forces brought them forth by their own unaided power.
4. Under the guise of a pretended humility, the Agnostic or "*Know-nothing*" is guilty of the most tremendous presumption; for in holding that there *may* not be a Being distinct from the Universe—that the Universe itself may be the *Uncaused* Being—he thereby assumes that it is possible for the human mind *to subject to analysis the very essence* of Uncaused Being.

The Agnostic's negation of all positive knowledge thus involves, by implication, the possibility that he may be possessed of the Ultimate Secret of Things.

5. They recognize themselves as *natural products*, yet they constantly reason as if they stood *outside of* nature; for whilst they claim for themselves certain attributes, as conscious existence, Intelligence, Designing power, &c., they deny these attributes to the nebulous cloud whence they trace their origin; thus,
6. They run into the absurdity of postulating a Causative Power which is Inferior to the Effect it produces.
7. They place at defiance not only the teachings of science, but the loftier promptings of the Moral Sense. Science asserts True progress, whilst their theory when examined makes no distinction between progress and retrogression or Dissolution, for both conditions are equal, and alternately give rise to one another. Human progress with them is limited to this sphere of being, and when the Earth has arrived at that stage of existence when it will be incapable of supporting life, the process will cease, and Dissolution will set in. Thus True Evolution becomes an impossibility.
8. They annihilate the whole moral world, and render all true religion impossible. All of our ideas and emotions are to be expressed in terms of matter and force.

   Virtue and vice mean nothing more than the difference in the arrangement of the molecules of which the brain is composed; there is, therefore, no such thing as moral responsibility. Might becomes the arbiter of the right; and justice and virtue must be relegated to the dim shades of a superstitious past.

In conclusion, we may quote the language which Mr. Spencer uses in criticising the doctrine of Special Creation.

Thus, however regarded, the theory of Involution or Atheistical Evolution "turns out to be worthless—worthless by its derivation; worthless in its intrinsic incoherence; worthless as absolutely without evidence; worthless as not supplying an intellectual need; worthless as not satisfying a moral want. We must, therefore, consider it as counting for nothing in op-

position to any other hypothesis respecting the origin of the Universe."

And thus we are compelled to admit the existence of an Uncaused, Immaterial, Divine Being. In the beginning He created matter, and—if we accept the doctrine of True Evolution—impressed upon it those laws or forces by virtue of which the innumerable worlds and man himself were brought forth.

In the immortality held out to us by religion, the word Evolution comes to have a new and grander significance.

Atheism and Evolution are irreconcilable and contradictory: Religion and Evolution go hand in hand, and elucidate one another, for it holds out the promise of a never-ending development.

Those who will follow the behests of their higher nature need not be without the light and consolation which belief in a Supreme Beneficence pours in upon the mind, cheering and smoothing life's pathway, and elevating the individual to a just appreciation of his high destiny.

From the broad bosom of Material Creation, and from the innermost depths of the human Soul, they may hear a voice proclaiming, I am Alpha and Omega, the BEGINNING and the END.

APPENDIX.

[*The following was intended as a foot-note, and should have been introduced as a further exposition of the fourth Atheistical proposition considered in the last chapter.*]

The Atomic theory has always been regarded as the stronghold of Materialism, (disbelief in the existence of everything which is not what we call Matter,) yet, strange as it may seem to many, Materialism and belief in the existence of Atoms are mutually destructive.

An *Uncaused* thing can have no *compulsory* relation to any other *Uncaused* thing—*must be unconditioned.* Any relation which it might have to another *Uncaused* thing *must spring from within itself uninfluenced by anything outside of it—must be the result of Free volition.*

On the supposition, then, that there are such things as Atoms, and that they are Uncaused, and, therefore, *Unconditioned*, it is obvious that the mutual reaction existing among them cannot be the result of Necessity or Compulsion, but of Spontaneous conscious activity; for, were such interaction induced by Compulsion, then the premises with which we started as a necessary postulate of an *Uncaused* thing would be violated and rendered nugatory. The Materialist, therefore, who regards the Atoms as Uncaused, (and to be a Materialist he must so regard them,) and still denies self-consciousness and freedom to each, is guilty of a contradiction, for he takes away from the Atom, by this very denial, its *Unconditioned* and *Uncaused* nature.

If, setting at defiance all reason, he maintain that the Atom does possess self-consciousness and freedom, then he multiplies the mystery of the Universe in the same measure that *indefinite multitude* is greater than *Unity.* Instead of One God, he would have an indefinite multitude of Gods.

The Materialist, then, is reduced to the necessity of denying the Existence of Atoms, and to look upon the Universe as a continu-

ous unbroken mass of Matter. But this necessarily involves the denial of the existence of Space. And here the Materialist is met by the incontrovertible facts of Universal Experience. He cannot shut his eyes to the truth that what he calls Matter *is denser in some places than in others;* that, for instance, a cubic inch of iron contains *more* Matter than a cubic inch of air. But if he acknowledge this, and acknowledge it he must, then perforce he must likewise acknowledge that Space (which may be defined as the *absence* of what we call Matter) does exist. But if Space exists, the Universe cannot be *continuous Matter*, and what we call Matter must, therefore, be conceived of as consisting of *infinitesimal particles* (Atoms) separated from one another by Space; and to such particles, as already shown, an *Unconditioned* nature cannot be assigned.

An Uncaused, Unconditioned *limited* thing is a contradiction.

The Atoms, therefore, cannot be Uncaused, and Materialism is an absurdity.

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